

# **Palestine Health Research Results**

## **Maternal & Child**



## المقدمة:

يعتبر البحث العلمي من أهم الأنشطة الإنسانية التي يمارسها الإنسان فوق سطح كوكب الأرض في هذا العصر وفي العصور السابقة، وقد كان البحث العلمي على مر الأزمنة أساس النهضات والتقدم والتطور، وما ننع به اليوم من رقي وحضارة هو نتاج البحث العلمي المستمر بمختلف مجالاته.

ويعرف البحث الصحي بأنه كل جهد علمي منظم يهدف إلى تنمية المعرفة و المهارات في المجالات الصحية المختلفة و إيجاد الطرق الأفضل للوقاية والعلاج من الأمراض وكذلك تطوير نظام صحي قادر على الاستجابة بفعالية ونجاعة لاحتياجات السكان في ظل بيئة صحية ديناميكية.

وأيضاً فإن البحوث الصحية يمكن أن توفر معلومات هامة حول اتجاهات الأمراض وعوامل الخطر، ونتائج البرامج أو التدخلات الصحية العامة، وأنماط الرعاية المختلفة وتكاليف الرعاية الصحية واستخدامها، وكذلك يمكن أن توفر معلومات هامة حول فعالية التدخلات الطبية والجراحية، وتحسين استخدام الأدوية واللقاحات، أو تطوير الأجهزة الطبية، وطرق التشخيص.

كما أنها حيوية لتسجيل وتقييم الخبرة في الممارسة السريرية من أجل وضع مبادئ توجيهية لأفضل الممارسات وضمان الرعاية العالية الجودة للمرضى.

ونحن في وزارة الصحة وإدراكاً منا للدور الهام للبحث العلمي وكذلك للمسؤولية والدور المناط بنا في قيادة مسار التطوير والتدريب أتحنا الفرصة للباحثين وطلبة كليات الطب والصيدلة والعلوم الطبية الأخرى لعمل الأبحاث والتدريب في مرافق وزارة الصحة المختلفة ضمن الضوابط والقوانين المنظمة والمعمول بها من أجل تحقيق الهدف والنهوض بالقطاع الصحي من خلال دعم التعليم الطبي والبحث الصحي. ونحن في الإدارة العامة لتنمية القوى البشرية نقوم بتنظيم ومتابعة هذا النشاط البحثي من خلال دائرة البحث الصحي التي تقوم في هذا المجال بـ:

- الإشراف علي هذا النشاط البحثي داخل مرافق الوزارة
  - توجيه الباحثين للأماكن التي سيقومون بتنفيذ الأبحاث بها
  - التأكد من الإجراءات التي تحفظ حقوق المبحوثين
  - تدقيق الجانب الأخلاقي من الأبحاث
  - الحفاظ على ممتلكات الوزارة.
  - توثيق الأبحاث التي يتم انجازها
  - توصيل نتائج البحوث لذوي العلاقة والمهتمين وصناع القرار في الوزارة.
  - عمل الإحصائيات والتقارير المتعلقة بالأبحاث
- لكن يبقى السؤال الملح وهو كيف يمكن الاستفادة من هذه الأبحاث ونتائجها في تطوير وتحسين الخدمات الصحية؟

لذلك قمنا بإنشاء صفحة على شبكة الانترنت (ضمن موقع الوزارة) خاصة بعرض ملخصات البحوث التي تجرى في الوزارة، كما قمنا بتصنيف رسائل الماجستير (التي حصلنا عليها من الجامعات و الباحثين) إلى عدة موضوعات وقد بدأنا بإعداد مجلة تشمل ملخصات الرسائل العلمية ونتائجها وتوصياتها من أجل توصيلها لذوي العلاقة والمهتمين وصناع القرار في المستويين الطبي والإداري.

## Table of Contents

No.	Title	page
1	Some Biochemical Changes Associated with Taking Oral Contraceptive Pills Among Healthy Women in Gaza City	4
2	Assessment of Thyroid Function in Pregnant Women From Rimal Health Center, Gaza City	6
3	Association of Maternal Vitamin A Status during Pregnancy and Pregnancy Outcome: A Prospective Cohort Study	8
4	Biochemical and hematological profile of normal pregnant women in Gaza Governorate, Gaza strip	11
5	Effect of Maternal Obesity on Pregnancy Outcome In Gaza Governorate	14
6	Effect of Maternal Malnutrition on Infant Birth Weight in Gaza governorate.	17
7	Endothelial Nitric Oxide Synthase "eNOS" Gene Polymorphisms, Nitric Oxide and Progesterone levels in Idiopathic Recurrent Pregnancy Loss	21
8	Iron Status of Pregnant Women and their Newborns in Gaza	24
9	Impact of Calcium and Magnesium Dietary Changes on Premenstrual Syndrome in Gaza Strip	27
10	Evaluation of Insulin-Like Growth Factor Binding Protein-1 among Infertile Women with Poly Cystic Ovary Syndrome in Gaza strip .	29
11	Vitamin D Status and Fracture Neck of Femur among Post-Menopausal Women in Gaza Strip: A Hospital Based Study	32
12	Polycystic ovary syndrome in women with type1 diabetes in Gaza Governorate	35
13	The Impact of Exclusive Breast Feeding on Bone Density among Young Women Attended Ard Al-Insan Society-Gaza	38
14	قلق الحمل وعلاقته بالمساندة الاجتماعية والصلابة النفسية لدى النساء ذوات المواليد بعيب خلقي	41
15	Relationship between Mental Health and Self Esteem Among Mothers of Children with Mental Disability in Gaza Governorates	42
16	Association between Selected Maternal Plasma Micro-RNAs and Idiopathic Recurrent Pregnancy Loss	47
17	Evaluation of Calcium and Magnesium among Newly Diagnosed Women with Pregnancy Induced Hypertension in El-Shifa Hospital: A Case Control Study	50
18	Efficacy of Measles, Mumps, Rubella and Pertussis Vaccination in Children from Gaza, Palestine	53
19	Mortality Trends of Congenital Anomalies among Infants in Gaza Strip from 2001-2010	55
20	Nutrition Assessment of Palestinian Children Less than Three Years Old with Rickets in Gaza Strip	59
21	Incidence of Enteric Pathogens Causing Community Gastroenteritis among Kindergarten Children in Gaza Governorate	62
22	The Relationship Between Stunting And Zinc Deficiency Among Toddlers Aged 1-3 Years In Gaza Strip	65
23	Iron Deficiency Anemia Among Kindergarten Children Living in Marginalized Areas in Gaza Strip	69
24	The Association between Serum Vitamin D Levels and Anthropometric Measurements among Children from 12-36 Months Old Attending Ard El-Insan Clinics in the Gaza Strip	73
25	In depth Analysis of Risk Factors for Coeliac Disease Amongst Children Under 18 Years Old in the Gaza Strip, A Cross Sectional Study	75

# Some Biochemical Changes Associated with Taking Oral Contraceptive Pills Among Healthy Women in Gaza City

by  
**Islah M. Abu Hani**

Supervisor  
**Prof. Dr. Baker M. Zabut**

*The Islamic University –Gaza*  
2010

## **Abstract**

**Aim:** To evaluate some biochemical changes associated with oral contraceptive (OC) pills administration on healthy women in Gaza City (GC).

**Methodology:** The study design was a case control. The sample size was 80 healthy women aged 20-35 years from the Swidey Clinic who had taken OC pills for at least three continuous cycles. The control sample was healthy married women who were not going on OC before and match the cases in age and residence. The study questionnaire included issues about the following information: age, gender, weight, height, health history, blood pressure, Nature of menstrual cycle, bleeding, insomnia, pain in the stomach, difficulty in breath, pain in hands and feet, appetite and headaches.

Blood parameters analysis of the study population included complete blood count (CBC), C-reactive protein (CRP), high density lipoproteins cholesterol (HDL-C), low density lipoproteins cholesterol (LDL-C), total cholesterol (TC), and triacylglycerol (TAG). Leptin determination was carried out using a commercially available diagnostic system test kits. SPSS were used to analyze obtained data.

**Results:** The results showed statistically significant differences among study population with respect to regular of menstrual cycle (MC) ( $\chi^2=5.371$ ,  $P= 0.024$ ), increased appetite ( $\chi^2= 4.386$ ,  $P= 0.002$ ), increased headache ( $\chi^2= 6.82$ ,  $P= 0.000$ ), increased body mass index ( $\chi^2= 7.31$ ,  $P= 0.015$ ), cholesterol were significantly higher among the cases compared to control ( $179.1 \pm 4.3\text{mg/dl}$  vs  $157.5 \pm 4.12\text{mg/dl}$ , and  $p=0.000$ ), LDLC were significantly higher among the cases compared to control ( $97.6 \pm 3.8\text{mg/dl}$  vs  $86.2 \pm 3.4 \text{ mg/dl}$ , and  $p=0.002$ ), increased C-reactive protein ( $\chi^2= 5.381$ ,  $p= 0.034$ ), there were a significant increase in the mean level of leptin among the cases compared to the controls ( $36.3 \pm 2.3 \text{ ng/ml}$  vs.  $28.6 \pm 2.1 \text{ ng/ml}$ , and  $p= 0.003$ ), and the levels of WBC, Gran and Mch were significantly higher among the cases ( $7.2 \pm 2.1 \text{ K}/\mu\text{L}$ ,  $60.7 \pm 8.3 \%$  and  $26.9 \pm 2.2\text{pg}$ ) compared to the controls ( $6.6 \pm 1.7 \text{ K}/\mu\text{L}$ ,  $54.9 \pm 11.7 \%$  and  $25.7 \pm 3.4 \text{ pg}$ ), with  $p=0.001$ ,  $p=0.000$  and  $p=0.003$ , respectively. In contrast, the results showed no statistically significant differences among the study population with respect to frequency of bleeding ( $\chi^2=0.192$ ,  $P=0.135$ ), frequency of insomnia ( $\chi^2=0.411$ ,  $P=0.353$ ), pain in stomach ( $\chi^2=0.386$ ,  $P=0.183$ ), difficulty in breathing ( $\chi^2=0.497$ ,  $P= 0.209$ ), frequency of pain in hands and feet ( $\chi^2=0.631$ ,  $P= 0.309$ ), Systolic blood pressure ( $\chi^2=2.351$ ,  $P=0.139$ ), diastolic

blood pressure ( $\chi^2=1.372$ ,  $P=0.382$ ), HDL-c ( $51.2\pm1.7\text{mg/dl}$  vs  $47.6\pm1.3\text{mg/dl}$  and  $p=0.148$ ), TAG ( $119.2\pm 6.0\text{mg/dl}$  vs  $108.2\pm 8.6 \text{ mg/dl}$  and  $p=0.218$ ), the changes among the study population in Mid, RBC, Hb, Hct, MCV, MCHC and PLT ( $7.8\pm8.7\%$ ,  $4.6\pm0.7\text{M}/\mu\text{L}$ ,  $12.2\pm0.9\text{g/dl}$ ,  $38.0\pm2.4\%$ ,  $80.8\pm11.9\text{fl}$ ,  $32.5\pm1.1\text{g/dl}$  and  $279.3\pm87.6\text{K}/\mu\text{L}$ ) compared to control were not significant ( $8.6\pm6.6\%$ ,  $4.6\pm0.47\text{M}/\mu\text{L}$ ,  $12.3\pm1.1\text{g/dl}$ ,  $37.5\pm3.7\%$ ,  $80.6\pm8.5\text{fl}$ ,  $32.3\pm1.7\text{g/dl}$  and  $267.8\pm74.0\text{K}/\mu\text{L}$ ), with  $p=0.352$ ,  $p=0.394$ ,  $p=0.387$ ,  $p=0.571$ ,  $p=0.415$ ,  $p=0.272$  and  $p=0.185$ , respectively.

Moreover, the results showed strong correlation between BMI and leptin ( $p= 0.000$ ) among the study population.

**Key words:** Oral contraceptive, Healthy women, Biochemical parameters, Gaza City.

## Conclusions and Recommendations

### Conclusions

1. Frequent use of OCs could cause regulation of menstrual cycle, increase appetite, feeling of headaches as well as increases in BMI, cholesterol, LDL-C, and Leptin.
2. Frequent use of OCs could not affect bleeding, frequency of insomnia, stomachache, difficulty in breathing, frequency of pain in hands and feet, SBP, DBP, HDL-c, and TAG.
3. There was strong correlation between BMI and leptin among the case study.
4. Frequent use of OCs could cause significant increase in WBC, Gran, and MCH among the study population.

### Recommendations

1. The risk factors of OCs intake such as increase in appetite, body fat composition, blood fats and modifying immune system, should be taken in consideration and required integrated relevant interventions.
2. More awareness sessions on health eating pattern for mothers who are going on OCs should be implemented in schools, audio-vision systems, and local organizations
3. Monitoring body weight as well as biochemical examinations must be carried out monthly for every OCs woman.
4. More deep and screening research studies about the effect of OCs intake on some other anabolic steroid hormones and heat generating hormones such as thyroid ones could be addressed and conducted by higher level of responsibility from Ministry of health (MOH) in cooperation with universities in Gaza strip.
5. More research could be conducted on long term consequences of OC use.

# **Assessment of Thyroid Function in Pregnant Women From Rimal Health Center, Gaza City**

by  
**Raghda A. A. Radi**

Supervised by  
**Prof.Dr Mohammad E. Shubair**

*The Islamic University-Gaza*  
*2010*

## **Abstract**

**Background.** Pregnancy is associated with significant but reversible changes in thyroid function tests results, which are as a result of a normal physiologic state.

Pregnancy influences thyroid function and may bring to light mild and latent disorders. This study focused on thyroid hormones as the human fetal thyroid does not secrete thyroid hormones until approximately 12 weeks of gestation, the fetus is dependent until that time on a supply from the maternal circulation. Thyroid dysfunction has been related to obstetrical complications such as premature delivery, gestational hypertension, preeclampsia, and placental abruption.

**Objective:** to assess the maternal thyroid function in the first trimester of pregnant women from Rimal health center-Gaza city.

**Materials and methods.** A cross sectional study was designed with 90 normal pregnant women who were randomly selected from the first trimesters attending *Rimal Health Center* and 80 randomly selected non-pregnant healthy female controls. Age range in both groups was 18-40 years. Thyroid function tests were carried out by measuring serum levels of thyroid stimulating hormone (TSH), free thyroxine (FT4), and free triiodothyronine (FT3). They were measured using Microparticles Enzyme Immunoassay (MEIA). SPSS was used to analyse obtained data.

**Results:** The results showed that there was a significant increased between the non pregnant women group and pregnant women for FT4 and FT3 where the p-value is 0.04 and 0.030 respectively. the mean TSH levels of pregnant women was lower than the mean level of non pregnant but did not show significant difference in first trimester compared with non-pregnant women. Also there was a significant statistical difference between the groups of different age for FT4 and FT3 where the p- value was 0.034 and 0.038 among the non pregnant women group. On the other hand, there was no statistically significant relationship between thyroid function in pregnancy and family history of thyroid problems, genetic disease, and hypertension among women in the study sample.

**Keywords.** *Pregnancy, thyroid function, TSH, FT4, FT3, Gaza, Palestine.*

## **Conclusions And Recommendations**

### **Conclusions**

1. Hypothyroidism was observed in 2.38 % of our population, 2.2% in pregnant women and (2.5%) in non pregnant women. While hyperthyroidism was observed in 1.0 % of our pregnant women.
2. The study showed a significant difference between pregnant and non-pregnant women in relation to FT4 and FT3 level.
3. The mean TSH levels of pregnant women was lower than the mean level of non pregnant. However these results were not statistically significant.
4. There was no significant difference between those who had abnormal thyroid hormones and those who had normal hormones levels in cases as well as in control group.
5. There was no significant difference between those who had history of thyroid problem in their family and those who did not have history of thyroid problem in their family in cases as well as in control group.
6. There was no significant difference between those who had genetic disease in their family and those who did not in both cases and in control.
7. There is no significant difference between those who had past abnormal delivery and those who had past normal delivery.
8. There was no significant difference between those who had hypertension during pregnancy and those who did not have hypertension .
9. There was significant relationship between age and both FT3 and FT4 in the control group.
10. There was no significant difference between thyroid function and gestational age.

### **Recommendations**

1. Thyroid function testing TSH and FT4 studies prior to conception or in early pregnancy is recommended.
2. Pregnant women in the following categories should have thyroid function assessed either at diagnosis or at antenatal booking, or even before conception if feasible type-1 diabetes, previous history of thyroid disease, current thyroid disease, family history of thyroid disease, goiter, symptoms of hypothyroidism
3. Assessment thyroid peroxidase (TPO) antibodies.
4. Assessment of HCG level in the first trimester of pregnancy.
5. More research concerning thyroid gland should be performed to include 2nd and 3<sup>rd</sup> trimester with larger sample size.
6. It is recommended to launch a program aiming at determination of normal levels of thyroid hormones during the three phases of pregnancy.
7. The relationship between thyroid hormones and other hormones during pregnancy should be investigated.

# Association of Maternal Vitamin A Status during Pregnancy and Pregnancy Outcome: A Prospective Cohort Study

By  
Raneem Al Shawwa(MBBch)

Supervisors

**Dr.Jehad H. Elhissi**  
*AAssist. Prof. of Public Health*  
CCollege of Medicine  
AAI-Azhar University-Gaza

**Dr.Mazen A. El-Sakka**  
*Assist. Prof. of Pharmacognosy*  
C College of Pharmacy  
Al-Azhar University-Gaza

*Al Azhar University – Gaza*  
2014

## Abstract

**Background:** The most important determinants of restricted fetal growth in the Western world are a low pre-pregnancy body mass index and a low gestational weight gain. Micronutrient malnutrition represents an important challenge for public health worldwide, particularly in vulnerable population groups such as pregnant women. Dietary vitamin A deficiency (VAD) can cause metabolic abnormalities that may lead to various pathologic states. **Goal:** To clarify the vitamin A status in pregnant women and its effect on pregnancy outcome. **Methodology:** A prospective cohort study will be conducted on pregnant women in their third trimester, the study will be conducted in maternal health department in Al Rimal clinic-Gaza city. With concurrent measurement of dietary, lifestyle and anthropometric exposures as well as vitamin A level was performed, in which 92 pregnant women were recruited at their visit to Al Remal clinic in Gaza city between July and September 2013. **Results:** The prevalence rate of vitamin A deficiency among study population is (30.4%). Around three quarters (78.3%) of the participants has low serum iron level. About two thirds (65.2%) of the participants are anemic. The mean maternal age is  $25.34 \pm 5.01$  years, with minimum age is 15, and maximum age is 40. The results show that 45 (48.9%) of participants are eating less than three meals per day, there is a significant association between serum vitamin A and numbers of meals taken per day at 0.05 level of significant. About 81 (88%) from the sample have a birth spacing between pregnancies 24 months or less, more than half of participants 47 (51.1%) suffering from GIT disorders, i.e. nausea, anorexia, vomiting, and diarrhea. A strong significant association between maternal weight in first and third trimester at 0.05 level of significant. An insignificant positive correlation between vitamin A daily intake from milk, protein and fruits sources and serum vitamin A and an inversion correlation between vitamin A of vegetables and serum vitamin A. The mean of infant head circumference for mothers with normal serum vitamin A is higher than those of low

vitamin A with statistical significance. **Conclusion:** Serum vitamin A levels were not affected by maternal age and parity. The prevalence rate of vitamin A deficiency among the study population is (30.4%). **Recommendation :**Raising the level of nutritional knowledge among health professionals and their staff on the health of pregnant women and the need for clinical nutritionist to be present within the follow-up group for pregnant women is required.

**Keywords:** *Vitamin A status, Pregnancy, Third trimester.*

## **Conclusions And Recommendations**

### **Conclusions**

The current study includes the impact of patient's dietary behavior, socioeconomic factors, and lifestyle on vitamin A status during pregnancy and the effects of vitamin A on pregnancy and pregnancy outcome. It was included:

1. More than two third of the samples (77.2%) maternal age was between 20- 35 years old.
2. More than half of the sample was married in age 19 years old or more.
3. Maternal serum vitamin A levels were not affected by maternal age and parity.
4. Current study results indicated a significant association between serum vitamin A and numbers of meals taken per day.
5. The study results indicated a significant association between serum vitamin A and having a daily breakfast during pregnancy.
6. The results show a significant association between child head circumference and serum vitamin A.
7. The results of current study indicated an insignificant association between serum vitamin A and maternal fast food intake, snacks, dairy products intake, fruits and vegetables intake after meal.
8. The present study results show an insignificant association between serum vitamin A and the daily intake of vitamin A from diet as from milk, protein, vegetables and fruits.
9. The prevalence rate of vitamin A deficiency among the study population is (30.4%).
10. Around three quarters (78.3%) of the participants has low serum iron level.
11. About two thirds (65.2%) of the participants are anemic.
12. Study results indicated a significant association between maternal blood hemoglobin and serum vitamin A.
13. The results indicated a strong significant association between maternal weight in first and third trimester.
14. More than two thirds of participants (84.2%) who took omega at daily basis, their serum vitamin A level is normal.
15. More than three quarters of participants (84.2%) who took iron and folic acid at daily basis, their serum vitamin A level is normal.

16. According to birth spacing (72.7%) of study participants who has normal serum vitamin A level, space their pregnancies for more than 24 months.
17. Those who have normal vitamin A, didn't suffer post partum hemorrhage, with a statistical significance.

### **Recommendations**

Good nutrition status prior to and during pregnancy is associated with healthier infant outcomes. So, taking care of mother's nutrition even in the premarital period certainly reflect on the infant birth weight and subsequently on the future child health. So, the following recommendations are suggested:

#### **Recommendations to Policy Makers**

1. Raising the level of nutritional knowledge among health professionals and their staff on the health of pregnant women.
2. The need for clinical nutritionist to be present within the follow-up group for pregnant women.
3. Educational programs about healthy diet in pregnancy, to improve the nutritional status.
4. Awareness raising campaign should be conducted among pregnant women for the importance of iron, folic acid and omega3 supplementation.
5. Designing a small booklet containing tables of different types of food and beverages and its amount for pregnant women.
6. Educational programs about importance of birth spacing more than 24months.
7. Enforce the calculation of BMI and weight gain at antenatal clinics.
8. Support fortification of food (rice, sugar, flour).

#### **Recommendations to Pregnant Women**

1. The ideal age for a woman to have children is between 20 and 35.
2. Pregnant women should increase their knowledge about pregnancy, how to have a healthy baby.
3. Pregnant women should take care of their nutritional status through eating a healthy balanced diet, by eating small and recurrent five meals per day .
4. Pregnant women should have breakfast daily.
5. To start taking extra folic acid plus multivitamin supplements before the woman becomes pregnant.
6. Limiting the consumption of caffeinated containing products ,because caffeine decreases the availability of calcium , zinc, and iron.

#### **Recommendations to Pregnant Women about Vitamin A Supplementation**

1. Daily dietary intakes of vitamin A for pregnant women 770 ug/day.
2. Night blindness during pregnancy is a risk factor of both short- and long-term mortality among women.
3. Support postnatal vitamin A supplementation for both mother and infant in Ministry of Health (MOH) as in Nongovernmental health organization (NGOs).
4. The initiation of vitamin A supplementation should be carefully examined in each case.

# **Biochemical and hematological profile of normal pregnant women in Gaza Governorate, Gaza strip**

by  
**Sana R. Al-Tawil**

Supervisor  
**Prof. Maged M. Yassin**  
*Professor of Physiology*  
*Faculty of Medicine*  
*The Islamic University of Gaza*

*The Islamic University of Gaza*  
2013

## **Abstract**

**Background:** Pregnancy is associated with normal physiological changes that assist the nurturing and survival of the fetus. Biochemical and hematological parameters reflect these adaptive changes which become very important in the event of complications. The lives of eight million women are threatened, and more than 500,000 women are estimated to have died as a result of causes related to pregnancy and childbirth complications.

**Objective:** To assess biochemical and hematological profile of normal pregnant women in Gaza Governorate, Gaza strip.

**Materials and Methods:** This case-control design study included 150 healthy pregnant women sub-divided into three groups each consists of 50 women comprising at 1st, 2nd and 3rd trimesters, and 50 healthy non pregnant women. Questionnaire interviews were applied. Biochemical and hematological profiles were assessed. Data were computer analyzed using SPSS program version 18.

**Results:** The mean ages of controls and pregnant women in the first, second and third trimesters were  $27.4 \pm 6.3$ ,  $27.6 \pm 6.5$ ,  $27.3 \pm 6.8$  and  $27.7 \pm 6.6$  years old, respectively. Unemployment women and lower family income were more prevalent among pregnant women ( $P=0.008$  and  $P=0.000$ ). Medical history of the study population showed that the frequency of the previous pregnancy in controls was significantly lower than that in cases ( $P=0.020$ ). In general, blood pressure of the study population was within the normal range. However, diastolic blood pressures decreased in the first and second trimesters and then returned nearly to that of controls ( $P=0.017$ ). In the 3rd food and drink intake showed that pregnant women ate less fish and egg ( $P=0.003$  and  $P=0.005$ ) and more fruits and vegetables ( $P=0.046$ ) than non pregnant women. Coffee was drunk more frequently by non pregnant women ( $P=0.002$ ).

Glucose level was slightly lower in pregnant women than non pregnant women, with no significant difference ( $P=0.303$ ). Cholesterol, triacylglycerol and low density lipoprotein (LDL-C) were significantly higher in pregnant women particularly in the 2nd and 3rd trimesters compared to non pregnant women ( $P=0.000$ ). However, High

density lipoprotein (HDL-C) showed no significant change in pregnant and non pregnant women ( $P=0.769$ ). Total protein, albumin were significantly decreased particularly in the 2nd and 3<sup>rd</sup> trimesters compared to non pregnant women ( $P=0.000$ ), whereas globulin showed no significant difference ( $P=0.088$ ). Also, no significant change was observed in the activities of alanine aminotransferase (ALT) and aspartate aminotransferase (AST) enzymes among pregnant and non pregnant women ( $P=0.211$  and  $P=0.886$ , respectively). However, Alkaline Phosphatase (ALP) enzyme activity was significantly higher in pregnant women particularly in the 3rd trimester ( $P=0.000$ ). Urea, creatinine and uric acid concentrations were significantly lower in pregnant women in the 1st, 2nd and 3rd trimesters compared to non pregnant women ( $P=0.000$ ,  $0.000$  and  $0.027$ , respectively).

There was significant decrease in calcium concentration particularly in the 3<sup>rd</sup> trimester ( $P=0.015$ ). White blood cells and neutrophils were progressively increased in pregnant women with significant differences among various groups ( $P=0.002$  and  $P=0.000$ ) whereas lymphocyte count, Red blood cell count, hemoglobin, hematocrit, Mean corpuscular hemoglobin concentration (MCHC) and platelet were significantly decreased in pregnant women compared to non pregnant women as pregnancy advanced ( $P<0.05$ ). There was no significant change in Mean corpuscular volume (MCV), Mean corpuscular hemoglobin (MCH) ( $P>0.05$ ).

**Conclusions:** Biochemical and hematological parameters were altered during pregnancy. Cholesterol, Triacylglycerol, LDL-C and ALP were significantly increased whereas total Protein, albumin, urea, creatinine, uric acid and calcium were significantly decreased. WBC and neutrophils were significantly higher in pregnant women whereas RBC, hemoglobin, hematocrit, MCHC and platelet were lower.

**Keywords:** *Pregnancy, Hematological and biochemical profiles, Gaza strip.*

## Conclusions and recommendations

### Conclusions

1. The mean ages of controls and pregnant women in the first, second and third trimesters.
2. Unemployment and lower family income were more prevalent among pregnant women.
3. Medical history of the study population showed that the frequency of the previous pregnancy in controls was significantly lower than that in cases.
4. In general, blood pressure of the study population was within the normal range.
1. However, both systolic and diastolic blood pressures decreased in the first and second trimesters and then returned nearly to that of controls.
5. Food and drink intake showed that pregnant women ate less fish and egg, and more fruits and vegetables than non pregnant women. Coffee was drunk more frequently by non pregnant women.
6. Glucose level was lower in pregnant women than non pregnant women, with no significant difference.

7. Cholesterol, triacylglycerol and LDL-C were higher in pregnant women particularly in the 2nd and 3rd trimesters compared to non pregnant women. However, HDL-C showed no significant change in pregnant and non pregnant women.
8. Total protein, albumin and globulin were decreased particularly in the 2<sup>nd</sup> and 3<sup>rd</sup> trimesters compared to non pregnant women.
9. No significant change was observed in the activities of ALT and AST enzymes among pregnant and non pregnant women. However, ALP enzyme activity was higher in pregnant women particularly in the 3rd trimester.
10. Urea, creatinine and uric acid concentrations were significantly lower in pregnant women in the 1st, 2nd and 3rd trimesters compared to non pregnant women.
11. There was a general decrease in calcium concentration particularly in the 3<sup>rd</sup> trimester.
12. White blood cells and neutrophils were progressively increased whereas lymphocyte count, RBC count, hemoglobin, hematocrit, MCHC and platelet were decreased in pregnant women compared to non pregnant women as pregnancy advanced.

### **Recommendations**

1. Poor food and drink regime observed among pregnant women necessitate the presence of healthy food program in the antenatal care clinics. In this context, consumption of fruits along with the main meals of all women in reproductive age should be reinforced.
2. Frequent monitoring of blood pressure throughout pregnancy.
3. Estimation of lipid profile is strongly recommended as part of the laboratory investigations during second and third trimesters of pregnancy pregnancy so as to institute prompt management strategies to prevent deleterious effect of hyperlipidaemia associated with pregnancy.
4. Calcium and iron supplementation is recommended during second and third trimesters of pregnancy.

# Effect of Maternal Obesity on Pregnancy Outcome In Gaza Governorate

By  
**Suha R. Baloushah**

Supervisors

**Dr. Jehad H. Elhissi**

*Ass. Prof. of Public Health  
Faculty of Medicine - Al Azhar University  
Health and Nutrition Consultant*

**Dr. Usama Abu Mohsen**

*Asso. Prof. of Pharmaceutical Chemistry  
Faculty of Pharmacy- Al Azhar University*

*Al Azhar University – Gaza  
2013*

## **Abstract**

**Introduction:** maternal obesity has adversely affect on pregnancy outcome. This study focus on this outcome. **Goal:** to reveal the effect of maternal obesity on pregnancy outcome.

**Objectives:** To investigate the effect of maternal obesity on risk of gestational diabetes, to explore the effect of maternal obesity on risk of gestational hypertension and preeclampsia, to reveal the effect of maternal obesity on risk of macrosomic baby.

**Subject and methods:** This study is based on cohort prospective design. A systemized random sample for 200 mothers whose BMI was  $\geq 30\text{kg/m}^2$  at registration and their newborn from UNRWA clinics in Gaza City. **Results:** The study found some factors that are associated with adverse maternal outcome. Increasing in obesity degree will risk of hypertensive disorder, gestational diabetes; and having macrosomic new born. **Conclusion:** The study contributes in highlighting the relationship between maternal obesity and pregnancy outcome and provides possible intervention strategies that could contribute to reduce effect of maternal obesity on pregnancy outcome. **Recommendation:** It is recommended for women planning to be pregnant to keep their body weight within its normal limits; hiring nutritionist in each maternity unit. If the MAC is  $> 33\text{ cm}$ , a large cuff should be used for BP measurements.

**Key words:** *Maternal obesity; hypertensive disorder in pregnancy; gestational diabetes; macrosomic baby.*

## **Conclusion**

This study aimed to reveal the effects of maternal obesity on pregnancy outcome, the current subjects were randomly selected from UNRWA antenatal clinic, it included 200 cases; 15 participants were withdrawn from study with a response rate of 92.5%.

1. The study concluded that obesity has adverse effects on pregnancy outcome on both mothers and their infants.
2. Slightly more than three quarters of the participant aged less than 35 years.
3. Approximately half of the study participants got married at while they were adolescents.
4. It was observed that three quarters of study participants have completed secondary and university education.
5. Study participants represent 7% of labor force; and slightly less than half of them are living under poverty line.
6. It is concluded that two thirds of participants are anemic.
7. The mean of BMI of the total participant is over 33, where three quarters of them are in class 1 obesity and only one is super obese.
8. Gestational diabetes present in 4.9% of study participants. Those who are in class 3 obesity show two folds to be diabetic than those who are in class 1.
9. Gestational hypertension present in 11.9% of study participants. Those who are in class 3 obesity show more than two folds to be hypertensive than those who are in class 1.
10. Most of participants' calorie intake depends on carbohydrates where they have eaten two fold of recommended daily servings.
11. The study participants gave birth through Cesarean section at a rate of two folds of WHO recommendation.
12. The study participants are at increasing risk for postpartum hemorrhage as their BMI increase.
13. The study participants of class 3 obesity are three fold susceptible to suffer puerperal sepsis than those of class 1 obesity.
14. The study participants of class 3 obesity are two folds to give birth to macrosomic infant than those of class 1 obesity.
15. The majority of study participants who gave birth to macrosomic infants have received iron and folic acid supplements.
16. The study participants rarely offered a written dietary advice however; those received oral dietary instructions are more liable to have macrosomic infant by slightly less than two folds of those who don't receive.

## **Recommendation**

Health nutritional status prior to pregnancy is essential for healthy pregnancy outcome.

Nutritional counseling for obese pregnant mother is important for to minimize risk of obesity complication in antenatal period and intra-natal period, so the following recommendation are suggested.

**Recommendations for Pregnant Women**

1. It recommended for women who plan to get pregnant to keep their body weight within its normal limits and to avoid overweight and obesity.
2. It recommended for obese pregnant women to avoid excess calorie intake and to gain the recommended weight during pregnancy.
3. It recommended for anemic pregnant women to take their iron and folic acid supplementation.
4. It recommended for pregnant women attend the antenatal program and follow the physician instructions.
5. It recommended eating more protein and less carbohydrate.

**Recommendations for Health Service Providers**

1. Proper evaluation of blood pressure especially in obese pregnant women.
2. Application of a large cuff when measuring blood pressure for obese women whose MAC is > 33 cm.
3. Providing nutritional counseling for obese mother in preconception care.
4. Anemia problem among pregnant women should be thoroughly investigated.
5. Educational program about healthy diet in pregnancy.
6. Awareness raising campaign should be conducted among married women for the risk of obesity and overweight and healthy life style.
7. Awareness raising campaign should be conducted among pregnant women for the importance of iron and folic acid supplementation.
8. Enforce the medical staff to complete the data in the mother's maternity profile.

**Recommendations for Decision Makers**

1. Building capacity for primary health service providers
2. Establishment of obstetric unit to deal with obese pregnant women
3. Hiring nutritionist in each maternity unit to provide dietary program for obese pregnant women.
4. Educational program about healthy diet in pregnancy.
5. Enforce the calculation of BMI at governmental antenatal clinic.

# **Effect of Maternal Malnutrition on Infant Birth Weight in Gaza Governorate.**

By  
**Ola A. Al-Khodari**

Supervisors

**Dr. Jehad H. El-Hissi**  
*Assist. Prof. of Public Health  
and Community Medicine*

**Dr. Mazen A. El-Sakka**  
*Head of Pharmacognosy Dept  
Assist. Prof. of Pharmacognosy  
College of Pharmacy  
Al-Azhar University-Gaza*

*Al-Azhar University-Gaza  
2011*

## **Abstract:**

**Objectives:** This study was undertaken to reveal the effect of maternal malnutrition on infant birth weight, to assess the nutritional status of pregnant women, to study the factors that affect nutritional status of pregnant women, to clarify the relationship between pregnant malnutrition and infant birth weight in Gaza Governorate; and to find areas for improvement in antenatal care program regarding nutrition, supplementation and education, which in turn would help in developing a base line data that can help in developing a preventive program aiming towards reducing the rate of maternal malnutrition and its negative consequences.

**Subjects and methods:** A hospital based case control study was carried out at the larger governmental hospital, Al Shifa Hospital. 100 full term low birth weight infants and 200 full term normal birth weight infants and their mothers were included in the study. Data was collected through direct methods that included hematological information and indirect methods through a structured interview questionnaire.

**Results:** A lot of maternal anthropometric and nutritional factors were significantly related to infant birth weight positively; which include height, gestational weight gain, gestational age, poverty, mother education, life style (decreasing effort & work, increasing sleeping hours, eating breakfast daily, drinking milk, yogurt and juice, increasing eating carbohydrate and sweets and taking dietary supplements as iron with folic acid).

**Conclusion:** The study contributes in highlighting the relationship between maternal malnutrition and infant birth weight and provides possible intervention strategies that could contribute to reduce infants low birth weight in the Gaza Strip.

**Recommendation:** Establish a policy and strategy by a decision makers in order to improve nutritional status of pregnant women, presence of nutritionist in schools to make proper nutritional assessment and counseling for adolescent girls, more research

is needed to study the effect of age, obstetrical history, nutritional history, body mass index and smoking of pregnant women on infant birth weight in a more focused way.

**Key words:** *Maternal malnutrition; low birth weight infant; pregnant food habit.*

### **Conclusion:**

In the present study, the purpose was to reveal the effect of maternal malnutrition on infant birth weight. the current case control study was conducted at Al Shifa hospital, it included 100 cases [Low Birth Weight (LBW)] and 200 controls [Normal Birth Weight (NBW)] and their pregnancy outcomes. This research has indicated that maternal malnutrition will affect the infant birth weight through different variables.

1. More than half of study population got married while they are adolescents.
2. Increasing the chance in giving birth to LBW infants among citizen mothers more than refugees as the refugees were receiving food rations which could improve their nutritional status.
3. Low socioeconomic level as low maternal educational level and low family income were associated with LBW infants.
4. More than half of study population were poor and their nutritional needs were not met.
5. Short stature mothers ( $\leq 150\text{cm}$ ) and insufficient weight gain during pregnancy were associated significantly with low birth weight infants.
6. Increasing work overload during pregnancy was significantly associated with giving birth to LBW infants.
7. Sleeping for 8 hours and more was associated significantly with normal birth weight.
8. The research has indicated that eating breakfast daily during pregnancy was positively associated with infant birth weight.
9. Craving for certain food during pregnancy was associated positively with infant birth Weight.
10. Increasing intake of food rich in protein, carbohydrates, dessert and consuming milk, yogurt and juice daily during pregnancy were associated with increasing infant birth weight.
11. Consuming caffeinated beverages to more than 2 cups daily was associated negatively with infant birth weight.
12. Iron and folic acid supplementation during pregnancy was associated positively with infant birth weight.
13. The present study found that LBW among female infants were more than among male infants
14. Increasing gestational age was significantly associated with birth weight.
15. Increasing the chance of Cesarean Section and admission to neonatal intensive care unit were more among LBW infants than NBW infants.

**Recommendations:**

Good nutrition status prior to and during pregnancy is associated with healthier infant outcomes. So, taking care of mother's nutrition even in the premarital period certainly reflect on the infant birth weight and subsequently on the future child health. So, the following recommendations are suggested:

***Recommendation to policy makers***

1. Hiring nutritionist in each health center to provide a suitable counseling, advice, nutritional programs and nutritional assessment.
2. Educational programs to improve the mother nutritional status should be individualized according to the educational level of pregnant women.
3. Designing a small booklet containing tables of different types of food and beverages and its amount for pregnant women.
4. In order to avoid the effect of poverty and low incomes on the pregnant women, specific nutritional programs, and food aids should be given to pregnant women through all health care centers whether governmental or UNRWA centers.
5. Taking care of all Palestinian pregnant women whether citizens or refugees to avoid a fear of having nutritional problems among them; by different ways as giving them a donated food, food supplements suitable for pregnant women and having good suitable services in their primary health care centers.
6. Home visits for pregnant women may be helpful to make nutritional assessment, offer nutritional programs, advices, counseling and education especially for those who didn't attend the primary health centers.
7. Improve nutritional measuring assessment as mid upper arm circumference, height, body mass index, weight gain, biochemical test for pregnant women in all health care centers in order to improve pregnant women nutritional status and subsequently enhance pregnancy outcomes.

***Recommendation to pregnant women***

1. Encouraging women's attendance to health centers and considering factors that increase their utilization of services such as satisfaction studies, incentive programs and so on.
2. Pregnant women should increase their knowledge about pregnancy, how to have a healthy baby through attending different educating programs, reading a book or magazine deals with pregnant nutrition and health.
3. Pregnant women should take care of their nutritional status through eating a healthy balanced diet containing different macro and micronutrients, eating breakfast daily drinking at least three cups of milk or yogurt daily, increasing drinking of fresh juice drinks and taking food supplements as ferric with folic acid.
4. Enhancing maternal life style as sleeping at least for eight hours daily and avoid increasing workload in house or job..

***Recommendation to community***

1. Encouraging family support for pregnant mothers.
2. Encourage female's education as it imparts knowledge and thus modify dietary habits and quality of food consumed.
3. To have good nourished pregnant woman, this requires a good nourished childhood and adolescent girl through different nutritional programs.
4. Presence of nutritionist in each school to provide nutritional advice to children.
5. The role of different media is very important. So, educational programs to increase the awareness on the importance of nutritional status of women in different life span and her pregnancy outcomes.
6. Further studies are needed to study independently the relationship between different nutritional problems as anemia, heart burn and vomiting on infant birth weight.
7. More focused studies are required to find the association between obstetrical history, nutritional history, body mass index, smoking, age and residency.

# **Endothelial Nitric Oxide Synthase "eNOS" Gene Polymorphisms, Nitric Oxide and Progesterone levels in Idiopathic Recurrent Pregnancy Loss**

by  
**Emad M. El-Gharably**

Supervisor  
**Prof. Dr. Fadel A. Sharif**

*The Islamic University – Gaza*  
2012

## **Abstract**

Pregnancy is a hypercoagulable state with increased tendency for thrombus formation, a condition that is increased when combined with acquired or inherited risk factors that lead to thrombophilia. Recurrent pregnancy loss (RPL) is an important clinical and stressful problem that has been studied tremendously but the causes and treatment have not been fully resolved. RPL affects about 1-5% of women who conceive and accounts for about 20% of clinically recognized pregnancy losses. Despite extensive researches to explain the causative effects of RPL, about 50%-60% of RPLs are still idiopathic. The association between endothelial nitric oxide synthase (*eNOS*) polymorphism, their haplotypes, serum nitric oxide (NO) levels and RPL, were studied in different ethnic populations. The results, however, were contradictory.

**Objective:** This study was conducted in order to determine the association between *promoter -786 T>C*, *exon 7 Glu298Asp (894 G>T)* and *intron 4 (4a4b) VNTR* polymorphisms of *eNOS* gene, serum NO and progesterone (P4) levels, and idiopathic RPL in Palestinian women residing in Gaza strip.

**Method:** This study is an association study with a case-control design. The study population consisted of 45 (30 non-pregnant and 15 pregnant) women who suffered from unexplained RPL, and 45 (30 non-pregnant and 15 pregnant) healthy women matched for age and without previous history of RPL. Blood samples collection were carried out during the period from June 2011 to September 2011. Two blood samples were collected from each subject after fasting for 10-12 hours, one was whole blood and the other was serum. DNA was extracted from whole blood samples. The PCR products of *intron 4 (4a4b) VNTR* polymorphism were analyzed by allele-specific PCR, where it separated electrophoretically using ethidium bromide-stained 2% agarose gel. However, the PCR products of *exon 7 Glu298Asp (894 G>T)* and *promoter -786 T>C* polymorphisms by PCR-RFLP, where they digested using specific restriction enzymes and then separated electrophoretically using 2% agarose gel. Serum NO levels were measured spectrophotometrically, and P4 levels were measured using Immulite 1000 Analyzer.

**Results:** The *C* allele carrier which represented by (*CC + CT*) genotypes and the *C* allele of the *promoter -786 T>C* polymorphism are significantly associated with

increased risk of RPL, where they presented with a higher frequency in RPL women and were associated with decreased serum NO levels in this group (all P-values  $\leq 0.001$ ). Neither *exon 7 Glu298Asp(894G>T)* nor *intron 4 (4a4b) VNTR* polymorphism was significantly associated with RPL risk in the study population. The serum NO levels were lower in RPL patients as compared to their respective controls (P-value = 0.004). The study pointed to the presence of a positive proportional correlation between serum NO and P4 levels in the study population (P-value = 0.002, Correlation coefficient = 0.319) that might be attributed to the presence of a putative progesterone receptor binding site in the upstream promoter region of *eNOS*. The study also showed that the *promoter -786T>C* polymorphism was not associated with P4 level in the study population. **Conclusion:** The (*CC + CT*) genotypes (*C allele* carrier) and the *C allele* of the *promoter -786T>C* polymorphism are possible risk factors for RPL. The study showed that the (*C allele* carrier) which represented by (*CC + CT*) genotypes is associated with a decreased serum NO level that, in turn, is associated with RPL. Moreover, a positive proportional correlation between serum NO and P4 levels was evident. Therefore, balancing P4 and NO levels may be of benefit for maintaining pregnancy in those cases.

**Keywords:** *eNOS, Polymorphism, PCR, RPL, Nitric oxide, Progesterone, Gaza Strip, Palestine.*

## Conclusion and Recommendations

### Conclusion

1. The study showed that the *C allele* carriers which represented by (*CC + CT*) genotypes and the *C allele* of the *promoter -786T>C* polymorphism are a possible risk factor for RPL. Where they presented with a high frequency in RPL women and were associated with decreased serum NO levels in this group.
2. The present study confirmed that neither *exon7 Glu298Asp (894G>T)* nor *intron 4 (4a4b) VNTR* polymorphism is associated with the risk of RPL in Palestinian women.
3. Both *exon 7 Glu298Asp (894G>T)* and *intron 4 (4a4b) VNTR* polymorphisms did not show a significant effect on the serum NO level in the study population.
4. Regardless of the *eNOS* polymorphisms, the study showed that serum NO levels were lower in RPL patients as compared to their representative controls.
5. Our findings showed that there is a positive proportional correlation between serum NO and P4 levels in the study population.
6. The present study polymorphisms did not show a significant association between the *eNOS* *promoter -786T>C* polymorphisms serum and serum P4 level in the study population.
7. Our findings showed that the level of NO is critical for maintenance of a healthy pregnancy, and might play an important role in the pathophysiology of RPL.

## Recommendations

1. We recommend for testing the promoter -786T>C polymorphism of *eNOS* gene in all Palestinian women experiencing RPL, preeclampsia, other pregnancy related complications. it's also of unexplained cases.
2. Our results are in agreement with the previous studies which suggested that there is a possible correlation between the P4 inhibitors and NOS inhibitors, such results, may open the way to balancing *eNOS* gene expression and NO metabolism.
3. Since NO pathway plays an important role in the pathophysiology of RPL, thus, any factors balancing NO metabolism could be useful in the treatment of RPL, consequently, reducing the substantial morbidity and associated mortality.
4. It's recommended to perform larger studies and perhaps mrta-analysis in order to refine the frequency *intron 4 (4a4b) VNTR* polymorphisms among RPL Palestinian women, since the 4a4a genotype of *intron 4 (4a4b) VNTR* polymorphisms was not encountered any subject enrolled in the current study.
5. It's also recommended to perform a further study to investigate the association with the *intron 4 (4a4b) VNTR* polymorphism and serum nitric oxide levels.
6. Further studies are recommended in order scrutinize the molecular basis of the correlation between NO and progesterone/estradiol and the possibly of finding a sequence represents a putative progesterone receptor binding element in the promoter region of *eNOS*.
7. It's recommended to perform a larger studies to investigate the association between the *promoter -786T>C* polymorphism and serum P4 level in pregnant RPL matched to pregnant control women and non-pregnant RPL matched to non-pregnant control women.
8. As cGMP might be a more stable metabolite in the signaling pathway of NO, further studies are needed in order to verify the utility of cGMP in idiopathic RPL cases.

# Iron Status of Pregnant Women and their Newborns in Gaza

by  
**Mohammad El Hindi**

Supervisor  
**Prof. Dr. Mohammad E. Shubair**

*Islamic University – Gaza*  
2011

## **Abstract**

**Background:** Iron deficiency anemia (IDA) is one of the most common public health problems among pregnant women, particularly in developing countries. The risk of iron deficiency (ID) is particularly high in women with high multigravida and short intervals period between pregnancies, with an impact on maternal and fetal morbidity and mortality. It is regarded as the most important preventable cause of perinatal complications, such as premature delivery, intrauterine growth retardation and neonatal and perinatal death.

**Aim:** to investigate the relationship between IDA mothers and their neonatal iron status and to estimate birth weight of newborns who were born to IDA mothers.

**Materials and Methods:** A case control prospective study was used, 92 pregnant women with IDA and their newborn babies (case group) and 92 pregnant women non IDA and their newborn babies (control group). The mean age of mothers was 28.62. Self report structured interview was designed and blood samples were obtained from both groups. Stat fax in conjunction with a recently available ELISA kit were used for assessment of ferritin, and chemistry profile (serum iron, total iron binding capacity (TIBC) and transferrin saturation (%saturation). Cell-DYN was used for complete blood count (CBC) . SPSS version 19 was used as the tool for statistical analysis.

**Results:** The results of the present study showed significant difference in the mean value of parity, educational levels, interval period between pregnancies, nutritional dietary status, the iron supplements, among pregnant mothers and weight of newborns of previous delivery. There were a significant positive associations between hemoglobin, serum iron, TIBC, transferrin saturation of IDA of pregnant women and their newborns. Also there were significant positive associations between hematocrit (HCT), serum iron, TIBC of non IDA of pregnant women and their newborns.

There were significant differences in the mean values of serum ferritin, hemoglobin (HB) and HCT among newborns of IDA mothers and non IDA mothers ( 74.6±30.8 vs. 99.8±31.4 ng/ml, p=0.001; 14.83±1.7 vs. 15.32±1.49 g/dl, p=0.039; 44.7±5.58 vs. 47.34±4.67 %, p=0.001, receptively). In contrast, There were no significant difference in the mean values of serum iron, TIBC, % saturation (84.64±57.57 vs. 83.55±55.33 µg/dl, p=0.896; 283±92.81 vs. 264±131.44 µg/dl, p=0.250; 30.80±20.57 vs.

33.11±15.51 %, p=0.392, respectively). The study also showed that maternal ID affects iron status in their newborn and predispose them to IDA.

**Conclusion:** The study contributed in highlighting the role of the dietary intake of pregnant mothers, establishing new strategies for ensuring that mothers take iron supplementation regularly and administration of iron for newborns of ID mothers after delivery.

**Key words:** *Iron deficiency anemia, Pregnancy, Newborn, Gaza, Palestine.*

## **Conclusions And Recommendations**

### **6.1Conclusions**

As conclusions the present study revealed that

1. There are association between maternal iron status with neonatal biochemical and anthropometric characteristics in Gaza.
2. Serum ferritin is a more sensitive indicator of iron stores than HB and provides a better indication of iron status.
3. There was high significant correlation between the percentage of anemic and non anemic women who received iron supplements and multigravida, while there was no significant correlations regarding pregnancy loss.
4. There was a significant correlation between the anemic and non anemic women who take regular daily nutritional meals.
5. Anemia was significantly higher among low education women in comparison to well educational ones.
6. There was a significant correlation between the anemic and non anemic women concerning the interval between previous deliveries and anemic of previous newborns.
7. There was no significant correlation between the anemic and non anemic women and birth weight of newborn.
8. There was a significant correlation between maternal and neonatal iron status.
9. There was a significant correlation between neonatal HB, serum ferittin, HCT, MCV, MCHC.

**Recommendations**

1. Establishing a new strategies for ensuring that mothers take iron supplementation regularly and establishing nutritional education programs to improve the dietary intake of pregnant mothers.
2. Regular investigations of pregnant mothers for HB and other blood indices as well as ferritin.
3. Awareness programs for medical staff concerning anemia of pregnancy.
4. Other research studies are needed to establish the normal values of anemia indices in normal pregnant women and their babies.
5. Administration of regular iron supplementation during pregnancy and between pregnancies in high parity women.
6. Administration of iron for newborns of ID mothers after delivery.
7. Another approaches are requirement to improve the iron status of young infant is to delay the clamping of the umbilical cord after birth.
8. Other nutritional deficiencies have also been proposed to have an impact on maternal and fetal outcome, e.g. niacin and zinc deficiency which needed to be investigated in further research studies.

# Association between Selected Maternal Plasma Micro-RNAs and Idiopathic Recurrent Pregnancy Loss

By  
Heba M. El-Shorafa

Supervisor  
Prof. Dr. Fadel A. Sharif

*Islamic University –Gaza*  
2012

## Abstract

MicroRNAs are small noncoding RNAs that function to control gene expression. Recurrent pregnancy loss (RPL) is two or more consecutive pregnancy losses before 20 weeks of gestation. The aim of this study is to explore the expression level of a group of pregnancy-associated miRNAs in maternal plasma in normal pregnancy and RPL cases. We conducted a case control study on 100 Palestinian women: 60 patients with at least two unexplained consecutive pregnancy losses half of them were pregnant at the first trimester and the rest were non-pregnant and 40 healthy controls with at least two live births and no history of pregnancy loss; half of them were at their first trimester of pregnancy and the rest were non-pregnant. We investigated the relative expression of miR-21, miR-126, miR-155, miR-182, miR-222 and miR-517\* using quantitative real-time polymerase chain reaction and Ct method experiments. Differential expression was evaluated using Student t test and fold change analyses. Only the expression difference of miR-21, miR-126 and miR-182 between patients and controls in the pregnant group showed statistically significant difference (p-value  $\leq 0.05$ ) with fold decrease of 1.5, 1.6 and 5.6, respectively. In non-pregnant group miR-21, miR-126, miR-222 and miR-517\* expression were significantly different with fold decrease of 2.4, 2.9, 2.7 and 11.8, respectively. So miR-21 and miR-126 proved to be the most important microRNAs in idiopathic RPL as their level was significantly decreased in patients before being pregnant and during pregnancy.

**Key words:** RPL, miRNA, real time PCR, Gaza strip.

## Conclusion and Recommendations

### Conclusion

1. Our study showed that microRNA level differs between patients with idiopathic RPL and healthy controls before and during pregnancy.
2. miR-21 and miR-126 proved to be the most important microRNAs in idiopathic RPL as their level was significantly decreased in patients before being pregnant and during pregnancy.

3. miR-182 is a very important microRNA for women during pregnancy as we found that 5.6 fold decrease of this microRNA in maternal circulation of RPL cases during pregnancy.
4. miR-222 is an important microRNA for women before being pregnant with 2.4 decrease of this microRNA in maternal circulation in non-pregnant group without any significant change in pregnant group.
5. miR-155 does not seem to be important for pregnant women neither during pregnancy nor before being pregnant.
6. In agreement with other studies, miR-517\* is a pregnancy associated microRNA that appears in maternal circulation at the first trimester and disappears after delivery.
7. The use of miR-223 as an internal control in relative quantitation experiments of circulating microRNA by real time PCR proved to be superior to RNU6B.

### **Recommendations**

1. We recommend including testing certain microRNAs level for women suffering from unexplained RPL
2. To use microRNA mimics in order to increase microRNA expression especially miR-21 and miR-126 before and during pregnancy.
3. To investigate other pregnancy associated microRNA in order to determine the most important ones involved in maintaining pregnancy.
4. To use miR-223 in studies that involve relative quantitation of microRNA in plasma
5. It's also recommended to perform larger studies to investigate pregnancy associated microRNA with diagnostic value along with their crossponding target genes before, after and during pregnancy.
6. We recommend performing studies on placental tissues of early abortion from women suffering from unexplained RPL in order to determine the microRNA profile for such tissue.
7. Further studies are recommended in order to determine the importance of microRNAs for women suffering from unexplained RPL before being pregnant.

# Impact of Calcium and Magnesium Dietary Changes on Premenstrual Syndrome in Gaza Strip

By  
**Norhan Abu Ghalwa**

Supervisors

**Dr.Kanaan Al Wuhaidi**  
*Assist. Prof. of Organic Chemistry*  
*Faculty of Pharmacy*  
*Al-Azhar University-Gaza*

**Dr. Riad Al Qedra**  
*Assist. Prof. of Industrial Technology*  
*Faculty of Pharmacy*  
*Al-Azhar University-Gaza*

*Al Azhar University – Gaza*  
*2014*

## **Abstract**

Premenstrual syndrome (PMS) is a collection of physical, psychological and emotional symptoms occurring during the luteal phase of the menstrual cycle, followed by resolution within a few days after the onset of bleeding. Women with PMS consume more dairy products, refined sugar, and high-sodium foods than women without PMS.

**Goal:** The goal of this study is to reveal the relationship between dietary changes, health remedies and occurrence of PMS in the college of pharmacy.

**Objectives:** to reveal the effect of dietary behavior on premenstrual syndrome, identify the relationship between serum Mg and Ca with PMS, and to suggest ideas and recommendation of dietary intakes for women with PMS.

**Methodology:** A case control study, 98 participants from Pharmacy College with/without PMS who are the same age, between the periods January 2013 to November 2013. They will be recruited according to the inclusion criteria in the study after getting their consent.

**Result:** The mean of PMS scores for cases (19.69) significantly higher than control subjects (4.08). The study shows that there is a significant difference between the means of serum calcium level for control (9.26 mg/dl) and case (8.45 mg/dl). Furthermore, there is a significant difference between the means of serum magnesium level for control (2.34 mg/dl) and case (1.44mg/dl).

**Conclusion:** Regarding to the effect of dietary behavior on premenstrual syndrome, there is an obvious relationship between PMS and types of foods that are consumed. The more consumption of calcium and magnesium rich food is expected to minimize the complication of PMS and the other hand, consuming poor food in calcium and magnesium is expected to show more complication of PMS. However, almost 18% of the students under study have shown PMS complications.

**Recommendation:** It is recommended for who have PMS complications to follow dietary balances and to focus on rich food in calcium and magnesium also vitamin B6

and try to minimize in caffeinated beverages. That would help and to reduce or even to prevent the PMS discomfort and complains

**Keywords:** *Premenstrual syndrome (PMS), calcium, magnesium*

## **Conclusion**

In the current study, the goal was to reveal the relationship between dietary changes, health remedies and occurrence of PMS in the college of pharmacy.

The study was conducted in Al Azhar University –Gaza, faculty of pharmacy, included 49 Cases of PMS and 49 controls. This research indicated that PMS may be influenced by many variables, as follows:

1. There is relationship between low level of Ca and Mg with PMS.
2. There is relationship between Dietary Changes and natural health remedies and Women's pain and discomfort from premenstrual syndrome.
3. Regarding the effect of dietary behavior on premenstrual syndrome, significances for rice, poultry, fish, beans, falafel, egg, molokhia, potato, tomato, dates, raisins, pumpkin, spinach, cabbage, and majority of fruits except grapefruit.
4. All daily milk and dairy products intake that there are significant differences between the mean daily intake of all types of milk and dairy products for case and control groups at 0.05 level of significant.
5. Around two thirds of the samples are satisfied of family income.
6. The majority of students do not suffer from chronic stress problems, chronic depression, Feeling panicked, renal disease, migraine, anemia or colon disorder.
7. There is a significant association between lifestyle and their smoking status, practicing physical activities, coffee drink and sleeping.
8. Majority of the sample do not follow any diet regiment, with almost equally distribution of students between control and case groups.
9. The mean of PMS scores for cases (19.69) significantly higher than control subjects (4.08).
10. None of the Anthropometric measurements show a significant difference between the mean of control and cases group subjects at 0.05 level of significant.
11. On PMS scale, more than 82% don't have PMS complications.

## **Recommendation**

PMS status in selected target group should be concerned and be properly managed for improved clinical outcomes and reduce postoperative complications. Therefore programs should be planned to implement routine nutrition assessment, use of evidence based care plans. So, the following recommendations are suggested:

1. Women with PMS should ideally receive care from multidisciplinary care (gynecologists – psychiatrics – dieticians).
2. Eat to beat PMS, eat a healthy, balanced diet, rich in calcium and magnesium help to reduce PMS symptoms.

3. Drinking clear fluids like water during PMS helps to flush your system of toxins and will aid some of the side effects like acne.
4. Reducing caffeinated beverages eases PMS complains.
5. PMS cravings for sugar (chocolate) and salt are very common during this time of the month, thus reducing of both is recommended.
6. Eat plenty of high-fiber, starchy foods with a low glycemic index– it's thought some women may be more sensitive to the effects of low blood sugar levels in the run up to their period.
7. Get plenty of exercise – being active helps increase levels of endorphins to give you a natural high.
8. Materials, flyers & brochures regarding PMS awareness for community are necessary.

Finally this study could help in developing policy and determine an essential requirement for comprehensive care, and nutritional intervention which, could lead to development of better therapeutic and preventive strategies for dealing with this disease.

# **Evaluation of Insulin-Like Growth Factor Binding Protein-1 among Infertile Women with Poly Cystic Ovary Syndrome in Gaza strip**

by  
**Hana Zuheer Zumarra**

Supervisor  
**Prof. Dr. Baker M. Zabut**  
*Faculty of Science*  
*The Islamic University of Gaza*

*The Islamic University-Gaza*  
2015

## **Abstract**

**Background:** Poly cystic ovary syndrome (PCOS) is one of the most common endocrine disorders among women. It is thought to be one of the leading causes of female infertility. An elevated circulating concentration of insulin inhibits the production of insulin-like growth factor binding protein-1 (IGFBP-1), thus increasing the level of free IGF-I in serum and stimulating ovarian androgen production.

**Objective:** to evaluate of IGFBP-1 and its relation to other reproductive hormones among Poly Cystic Ovary infertile women in Gaza strip.

**Methodology:** The study was a case control and carried out in Specialized Medical Centers in Gaza strip. A total of 40 women with PCOS infertility were face to face interview was used for filling questionnaire which is designated for matching the study need and blood analysis for IGFBP-1, Follicular Stimulating Hormone (FSH), Luteinizing Hormone (LH), Testosterone, Dehydroepiandrosterone-Sulfate (DHEA-S), Thyroid Stimulating Hormone (TSH) and Insulin were performed . Moreover, forty fertile women were served as controls and they have been selected on the basis of being married, having children and matching the case in age and residence. Statistical Package for the Social Sciences (SPSS) system was used to analyze the obtained data.

**Results:** The mean body mass index (BMI) in patients compare to controls were (25.8 and 23.7) kg/m<sup>2</sup>, respectively. The mean of the serum IGFBP-1 levels were decreased significantly in the patients group compared to controls,(4.57 vs 9.2 ng/ml), (P=0.000). Moreover the serum LH, Testosterone, DHEAS-S, and Insulin were increased in patients compared to controls (18.77±7.05 vs 7.75± 2.14 mIU/ml, P=0.00) and (0.54±0.28 vs 0.35±0.18 ng/ml, P=0.00) and (2.06±1.01 v 1.0±0.43µg/ml, P=0.00) and (20.61±5.48 vs 6.86±1.62 mIU/ml), P=0.00), respectively. But the serum FSH, TSH were no significantly different between

patients and controls ( $6.11 \pm 1.77$  vs  $6.0 \pm 2.09$  mIU/ml,  $P=0.82$ ) and ( $2.61 \pm 1.07$  vs  $2.84 \pm 1.42$  mIU/ml,  $P=0.41$ ), respectively.

IGFBP-1 was negatively correlated with LH, Testosterone, DHEA-S, Insulin and BMI ( $r=-0.632, P=0.00$ ), ( $r=-0.389, P=0.00$ ), ( $r=-0.546, P=0.01$ ), ( $r=-0.590, P=0.00$ ) and ( $r=-0.411, P=0.00$ ), respectively among the study population. Its correlation with other parameters FSH and TSH were not observed ( $P>0.05$ ).

**Conclusion:** The significance decrease in the serum IGFBP-1 levels between PCOS infertile women and fertile women suggests that this hormone is involved in pathophysiology of PCOS infertility. IGFBP-1 was negatively correlated with LH, Testosterone, DHEA-S and Insulin. In contrast, no significant correlation was observed between the IGFBP-1 and FSH or TSH hormones which suggests that physiological concentration of serum IGFBP-1 does not directly influence FSH and TSH production.

**Key words:** PCOS, Infertile women, IGFBP-1 status, Gaza strip.

## Conclusions and Recommendations

### Conclusions

1. Medical history showed that 70% of patients reported administration drugs for hormonal activation.
2. Family history was not associated with PCOS .
3. The difference of BMI between cases and controls was significant ( $P= 0.000$ ).
4. Serum IGFBP-1 was significantly decreased among patients compared to controls ( $P= 0.000$ ).
5. Serum FSH did not show significant difference between patients and controls ( $P=0.82$ ).
6. Serum LH was significantly elevated in patients compared to controls ( $P= 0.000$ ).
7. Both serum Testosterone and DHEA-S were significantly increased in patients compared to controls ( $P=0.000$  for both).
8. Serum TSH did not show significant difference between patients and controls ( $P=0.41$ ).
9. Serum Insulin was significant increased in patients compared to controls ( $P=0.000$ ).
10. Serum IGFBP-1 was significantly negative correlated with BMI, LH, Testosterone, DHEA-S and Insulin ( $P=0.000$  for all).
11. Serum IGFBP-1 did not show significant correlation with FSH and TSH. Thus direct link between IGFBP-1 and these hormones cannot be ruled out.
12. In a conclusion, the results of present study indicated that obesity, hyperinsulinemia, hyperandrogenism, increase level of LH and decreased level of IGFBP-1 play a role in the process of PCOS among infertile women.

**Recommendations**

1. The present finding of this preliminary study showed that optimal IGFBP-1 secretion is necessary for normal reproductive function. Therefore, married women must try to have a normal threshold level of serum IGFBP-1 by following a specific diet or by consultation a nutritional doctor .
2. Suitable dietary and lifestyle regime for overweight women that affect in ovulation cycle and the range of IGFBP-1 may improve the fertility.
3. By reducing insulin levels by diet and exercises both hyperandrogenism and related clinical features tend to be improved.
4. Further studies are recommended to find out clear picture of the role of serum IGFBP-1 in treatment infertility among large scale of sample of married women.

# **Vitamin D Status and Fracture Neck of Femur among Post-Menopausal Women in Gaza Strip: A Hospital Based Study**

By  
**Mahmoud M. El-Ghaffari**

Supervisors

**Dr. Jehad H. Elhissi**  
*Asst. Prof. of Public Health  
Faculty of Medicine  
Al-Azhar University*

**Dr. Mahmoud H. Taleb**  
*Asst. Prof. of Pharmacology &  
Toxicology Faculty of Pharmacy  
Al-Azhar University*

*Al-Azhar University – Gaza  
2014*

## **Abstract**

Fracture neck of femur (FNOF) is one of the most common leading causes of disability and death among the postmenopausal women in Gaza Strip. Postmenopausal women are usually suffering from osteoporosis due to reduction of bone mass. Vitamin D deficiency in postmenopausal women is a multi-factorial in origin; lack of vitamin D rich diet, reduced absorption, decreased exposure to sunlight, reduce ability of the body to convert cholesterol to vitamin D, and decline of estrogen hormone production.

**Aim of the study:** To determine the relationship between vitamin D status and FNOF among postmenopausal women in the Gaza Strip.

**Study design and methodology:** A case-control study was consisted of 90 participants (45 cases and 45 controls), the study was conducted in the main governmental hospitals in Gaza Strip. Food Frequency Questionnaire (FFQ) was used to assess dietary intake of vitamin D. Anthropometric measurements were done included weight, height, and body mass index was calculated. Serum levels of phosphorus, calcium and Vitamin D were measured in both cases and controls.

**Results:** the study revealed the following results; the percentage of both vitamin D deficiency and insufficiency levels were higher among cases with FNOF (66.4%) than among controls (26.6%) with significance statistical differences ( $P = 0.001$ ). The mean of servings consumed per day from total diet vitamin D was less among cases with FNOF ( $1.46 \pm 0.91$ ) than controls ( $2.71 \pm 0.94$ ). Cases were less likely to be exposed to sunlight (53.3%) than controls (80%) ( $P = 0.007$ ), on the other hand cases were also less active (2.2%) than control (53.3 %) ( $P = 0.00$ ).

**Conclusion:** Postmenopausal women with FNOF in the Gaza Strip have low serum vitamin D level and low intake of vitamin D.

**Key words:** *Fracture neck of femur, Vitamin D, Calcium, Phosphorus, Dietary behavior, Body Mass Index, Life style, sun exposure, postmenopausal, Gaza Strip*

## **Conclusion & Recommendations**

### **Conclusion**

This study intended to reveal the relationship between vitamin D status and fracture neck of femur (FNOF) among postmenopausal women in the Gaza Strip. It study was a case-control conducted in the main governmental hospitals and included 90 participants divided into two groups: group A ( $n = 45$ ) patients with FNOF; group B ( $n = 45$ ) patients without any suspicion of bone disease.

The study concluded the following:

1. Advancing in age may associate with increased risk for development of FNOF.
2. There was an inverse association between educational level, income, employment and risk for FNOF.
3. Regarding Family History of Bone Disease, a significant a positive association between a positive family history of osteoporosis and FNOF.
4. Strong statistical a positive relationship was observed between low Serum Vitamin D level and elevated FNOF.
5. There was an inverse association between FNOF and participants who were exposed to sunlight.
6. There were highly of significance a positive association was observed between FNOF and participants who were physically Inactive.
7. There were highly of significance a positive association was observed between FNOF and participants who consumes less servings of milk, eggs, and fish which are rich with vitamin D and calcium.

### **Recommendation**

FNOF is considered as a serious health problem, associated with many factors and little has been unstated about vitamin D status in relation to bone health of postmenopausal women in the Gaza Strip, so the researcher summarized the following recommendations:

#### **Recommendation to policy makers**

1. Physicians recommended to include routinely testing their postmenopausal women for measuring 25(OH)D in serum blood level in the periodic checkups, and inform them about the importance of vitamin D regarding general health.
2. Build up an educational and prevention programs that may be implemented by governmental and the Non-Governmental Organizations (NGOs).
3. Indorse screening postmenopausal women to prevent FNOF to detecting postmenopausal women with low bone mineral density and that treating osteoporosis can reduce the risk of fractures in postmenopausal women.

**Recommendation to community**

1. Increase contact between subjects and health centers for women of post reproductive age.
2. Routinely monitor weight and manage thin, underweight, or small-boned women all have a greater chance of developing osteoporosis.
3. All postmenopausal women should increase consumption of vitamin D rich foods such as fortified milk, fish, liver, eggs and cheese, taking a vitamin D supplement.
4. Regularly exercise at least 3 times per week, for at least 20–30 minutes each time.
5. Exposure to sunlight at least 15 to 30 minutes of sun exposure per day at least three times weekly. Hands, face and both arms need to be exposed to the sun for adequate. Vitamin D synthesis.
6. Avoid smoking.

**Recommendation to researchers**

1. More research is needed to cover various aspects of osteoporosis among postmenopausal women.
2. Conduct a large scale study focus on vitamin D status and FNOF.

# **Polycystic ovary syndrome in women with type1 diabetes in Gaza Governorate**

By  
**Sana. I. EL-Qreenawy**

Supervisor  
**Prof. Dr. Maged M. Yassin**  
*Professor of Physiology*  
*Faculty of Medicine*  
*Islamic University of Gaza*

*Islamic University – Gaza*  
*Gaza-Palestine*  
*(2013)*

## **Abstract**

**Background:** Women with type 1 diabetes depend on insulin injections throughout their life. However, recommendation for strict metabolic control of diabetes requires the administration of supra-physiological doses of insulin, which might result in insulin-mediated stimulation of androgen synthesis. Hyperandrogensim in women with type 1 diabetes may be associated with polycystic ovary syndrome (PCOS).

**Objective:** To determine PCOS and associated clinical symptoms and biochemical alterations in women with type1 diabetes in Gaza Governorate.

**Materials and Methods:** This case-control study comprised 50 type 1 diabetic women selected from Medical Relief Center in Gaza Governorate and 50 apparently healthy non diabetic controls. Questionnaire interviews were applied. Anthropometric measurements were preformed. Serum total testosterone, follicle stimulating hormone (FSH), luteinizing hormone (LH), and insulin were measured by ELSA. Data were analyzed using SPSS version 18.0.

**Results:** The mean ages of controls and cases were  $23.8 \pm 5.2$  and  $23.3 \pm 5.7$  years. The mean period of first delivery after marriage was significantly longer in cases compared to controls. Type 1 diabetes was more prevalent among less educated and unemployed women as well as among women with family history of diabetes. The mean of waist to hip ratio was higher in diabetic women compared to controls. The mean age of menarche was significantly higher in diabetic women compared to controls ( $13.9 \pm 1.6$  vs  $13.2 \pm 1.2$  years,  $P=0.020$ ). The presenting symptoms including acanthosis nigricans, seborrhea and hirsutism were more prevalent in cases compared to controls. The levels of total testosterone and insulin were significantly higher in cases compared to controls ( $0.58 \pm 0.11$  and  $15.8 \pm 12.4$  vs  $0.44 \pm 0.11$  and  $10.8 \pm 4.5$ , % difference=26.3 and 37.6%,  $P=0.000$  and  $0.010$ , respectively). Polycystic ovary syndrome was present in 11 (22.0%) out of 50 cases compared with 3 (6.0%) in controls ( $\chi^2(\text{corrected}) = 4.070$ ,  $P= 0.044$ ). There was significant increase in PCOS frequency in cases with intensive insulin treatment 9 out of 22 (40.9%) compared to 2

out of 28 (7.1%) with non intensive insulin treatment. The Mean of waist to hip ratio was higher in PCOS than non PCOS cases. The mean insulin dose received by PCOS was significantly higher than non PCOS cases ( $72.7 \pm 23.9$  vs  $55 \pm 19.8$  U.I cc/ml,  $P=0.023$ ). Oligomenorrhea was reported in 11 cases with PCOS compare to 6 cases without PCOS ( $\chi^2(\text{corrected})=23.735$ ,  $P=0.000$ ). In addition, the mean age of menarche was higher in PCOS than non PCOS cases. The mean levels of testosterone and insulin were significantly higher in cases with PCOS compared to cases without PCOS ( $0.64 \pm 0.09$  and  $23.1 \pm 13.0$  vs  $0.53 \pm 0.11$  and  $14.1 \pm 11.8$ ,  $P=0.023$  and  $0.041$ , respectively).

**Conclusion:** Intensive insulin treatment was more frequently received by PCOS cases. Oligomenorrhea and increased levels of testosterone and insulin were the main features of PCOS.

**Key words:** Polycystic ovary syndrome, type1 diabetes, Gaza Governorate.

## Conclusions

1. The mean ages of controls and cases were  $23.8 \pm 5.2$  and  $23.3 \pm 5.7$  years old
2. The mean period of first delivery after marriage was significantly longer in cases compared to controls.
3. Type 1 diabetes was more prevalent among less educated and unemployed women as well as among women with family history of the disease.
4. Waist to hip ratio was significantly higher in cases compared to controls.
5. The mean age of menarche was significantly higher in cases compared to controls.
6. The presenting symptoms among the study population including acanthosis nigricans, seborrhea and hirsutism were more prevalent in cases compared to controls.
7. The levels of total testosterone and insulin were significantly higher in cases compared to controls
8. Polycystic ovary syndrome was present in 11 (22.0%) out of 50 cases compared with 3 (6.0%) in controls ( $\chi^2(\text{corrected})=4.070$ ,  $P=0.044$ ).
9. There was significant increase in PCOS frequency in cases with intensive insulin treatment 9 out of 22 (40.9%) compared to 2 out of 28 (7.1%) with non intensive insulin treatment.
10. The average of waist to hip ratio was higher in PCOS than non PCOS cases.
11. The mean insulin dose received by PCOS was significantly higher than non PCOS cases.
12. Oligomenorrhea was significantly higher in cases with PCOS compared to cases without PCOS. In addition, the mean age of menarche was higher in PCOS than non PCOS cases.
13. The mean levels of testosterone and insulin were significantly higher in cases with PCOS compared to cases without PCOS.

**Recommendations**

1. Insulin administration at appropriate dose under the supervision of a physician is recommended.
2. Frequent monitoring of serum testosterone and insulin particularly in women with history of diabetes.
3. Further research on PCOS in type 2 diabetes is needed.

# **The Impact of Exclusive Breast Feeding on Bone Density among Young Women Attended Ard Al-Insan Society-Gaza**

By  
**Ahmed M. EL.Najjar**

Supervisor  
**Dr. Mazen A. El-Sakka**  
*Assit. Prof. Pharmacognosy*  
*College of Pharmacy*

*Al Azhar University-Gaza*  
*2014*

## **Abstract**

**Introduction:** Breastfeeding is one of the most effective ways to ensure child health and survival. World Health Organization recommends mothers to exclusively breastfeed infants for the child's first six months to achieve optimal growth, development and health. **Goal:** To evaluate bone mineral density in Exclusive breast-feeding women aged 20-30 years old on 30 month from the beginning of last pregnancy. **Objectives:** To assess bone status using Dual energy x-ray absorptiometry (DEXA), to evaluate the influence of biochemical parameters on bone mineralization among women aged 20-30 years on 30 months from the beginning of last pregnancy and To enhance interest in mother and exclusive and complementary feeding until 30 months from the beginning of last pregnancy. **Methodology:** The study includes 40 women out of 70 women, aged 20-30 years old, who were collected from non-pregnant women and whose youngest child aged 21 months. A cross-sectional study with concurrent measurement of dietary, lifestyle exposures, biochemical analysis as well as DEXA level was performed. **Results:** The sample is distributed into the three mentioned groups, where 18 (45.0%) belong to group (A), 18 (45.0%) belong to group (B) and only 4 (10.0%) depends on the artificial feeding named group (C). About two-thirds of the sample 26 (65.0%) has monthly income less than NIS 1000. Six biochemical variables, namely (Phosphorus, Ionized Calcium, and Creatinine, Uric acid, Urea and Alkaline phosphatase) as well as the DEXA analysis are summarized according to the breast feeding group, there are insignificant differences between the means of any of the six biochemical variables with respect to the feeding manner group at 0.05 level of significance and there is a significant difference between the mean of DEXA for the three feeding groups at 0.05 level of significant, where the mean of group(A) is +0.79, and the mean of group(C) is -0.32. **Conclusion:** Young women who breastfeed exclusively for at least six months and complete breastfeeding with complementary food until 30 months from the beginning of last

pregnancy (group A) have more greater bone mineral density than other groups who weaned before (group B) or not breastfeed their last child at all and depend mostly on artificial feeding in the previous deliveries (group C). Women with higher educational level had practiced breastfeeding less and depend more on artificial feeding. Most of mothers diet behavior characterized by having missing meals, and large consumption of fast foods and sweets. **Recommendations** work on urging mothers to breastfeed their children for at least 30 months from the beginning of last pregnancy. Take care of their self during pregnancy and lactation by taking healthy diet and have their meals regularly, without consuming fast foods.

## **Conclusion and Recommendation**

### **Conclusion**

Pregnancy and breastfeeding both cause changes in women's bodies, these changes affect their bones, where transient bone loss occur during lactation because of the amount of breast milk produced but this bone loss regained again after weaning.

This study is carried out on 40 women aged 20-30 years in three groups according to the type and duration of breastfeeding to evaluate the impact of breastfeeding on bone mineral density, where the bone mineral density was measured using DEXA for the lumbar spine L2-L4, all of those mothers taken at 30 months from the beginning of last pregnancy .

At the end of the study and after data analysis we concluded:

- 1- Young women who breastfeed exclusively for six months and complete breastfeeding with complementary food until 30 months from the beginning of last pregnancy have more greater bone mineral density than other groups who weaned before or not breastfeed at all.
- 2- Women with higher educational level had practiced breastfeeding less and depend more on artificial feeding.
- 3- The majority of pregnant women were inactive during pregnancy.
4. Small percent of mothers follow diet regimen during pregnancy and lactation.
5. Most of mothers diet behavior characterized by having missing meals, and large consumption of fast foods, Soda drinks, and sweets.

### **Recommendation**

#### **Recommendations for policy makers**

1. Work on urging mothers to breastfeed their children for at least 30 months from the beginning of last pregnancy.
2. Continue their efforts that promote breastfeeding for mothers via awareness sessions that illustrate the benefits of breastfeeding for mothers and child and illustrate the importance of completing the breastfeeding and not to wean their children immaturely.

**Recommendations for mothers**

1. Complete breastfeeding for at least 30 months from the beginning of last pregnancy.
2. Take care of their self during pregnancy and lactation by taking healthy diet and have their meals regularly, without consuming fast foods
- 3- Practice sports during pregnancy(if not contraindicated) have many benefits for mothers.

**Recommendations for Researchers**

- 1- For researchers to operate more researches on the impact of soda drinks on bone health especially on lumber spine.
- 2- Further studies on a larger number of patients and for a longer follow-up periods are recommended to assess the long effect of exclusive breastfeeding on bone mineral density.
- 3- For researchers to operate more researches on the relation between uric acid and bone health.
- 4- Operate studies that investigate the correlation between number of children and bone mineral density including larger sample number.

## "قلق الحمل وعلاقته بالمساندة الاجتماعية والصلابة النفسية لدى النساء ذوات المواليد بعيب خلقي"

### خلقي

إعداد  
إيمان عبد الرحمن أبو قوطة

إشراف  
د. أنور عبد العزيز العبادسة

الجامعة الإسلامية - غزة  
2013

### ملخص الدراسة

هدفت الدراسة إلى التعرف على مستوى قلق الحمل، المساندة الاجتماعية، الصلابة النفسية لدى النساء ذوات المواليد بعيب خلقي، والكشف عن العلاقة بين قلق الحمل وكل من: المساندة الاجتماعية، الصلابة النفسية، ولتحقيق أهداف الدراسة ثم استخدام المنهج الوصفي التحليلي، وكانت أدوات الدراسة عبارة عن مقياس قلق الحمل "إعداد الباحثة"، مقياس المساندة الاجتماعية إعداد الباحثة، مقياس الصلابة النفسية إعداد عماد محمد مخيمر، وقامت الباحثة بتطبيق هذه الأدوات على عينة بلغ قوامها 150 امرأة سبق لها ولادة طفل بعيب خلقي، ثم اختيارهن بالطريقة العشوائية البسيطة من محافظة خان يونس.

وكانت أهم النتائج تشير إلى:

1. أظهرت النتائج أن (29.30%) من عينة الدراسة من النساء ذوات المواليد بعيب خلقي يشعرون بقلق منخفض، بينما كان (41.30%) يشعرون بقلق متوسط، وكان (29.30%) يشعرون بنسبة مرتفعة من القلق.
2. أظهرت النتائج أن (24.70%) من عينة الدراسة من النساء ذوات المواليد بعيب خلقي يدركن بأن لديهن مستوى منخفض من المساندة الاجتماعية، بينما كان (42.00%) منهن يدركن بأنهن يتلقين مساندة اجتماعية متوسطة، وكان (33.30%) يدركن مساندة اجتماعية مرتفعة.
3. أظهرت النتائج أن (30.70%) من عينة الدراسة من النساء ذوات المواليد بعيب خلقي يتمتعن بصلابة نفسية منخفضة، وأن (33.30%) منهن يتمتعن بصلابة نفسية متوسطة، بينما كان (36.00%) من النساء يتمتعن بصلابة نفسية مرتفعة.
4. أظهرت النتائج أنه لا توجد علاقة ذات دلالة إحصائية بين قلق الحمل والمساندة الاجتماعية لدى النساء ذوات المواليد بعيب خلقي.
5. أظهرت النتائج أنه لا توجد علاقة ذات دلالة إحصائية بين قلق الحمل والدرجة الكلية للصلابة النفسية، بينما ظهرت علاقة بين الحمل وبعدي الالتزام والتحدي، ولم تكن هناك علاقة ذات دلالة إحصائية بين قلق الحمل وبعدي التحكم.

وفي ضوء هذه النتائج أوصت الباحثة بما يلي:

1. ضرورة الاهتمام بالمرأة ذات المولود بعيب خلقي من قبل المؤسسات الاجتماعية المختصة وتقديم الدعم والمساندة الاجتماعية لتكون أكثر قدرة على تحمل الصعاب.
2. صياغة برامج إرشادية هادفة للتخفيف من حدة القلق لدى المرأة الحامل وتنقيفها بكيفية التعامل مع حملها.

## النتائج

1. أظهرت النتائج أن (29.30%) من عينة الدراسة من النساء ذوات المواليد بعيب خلقي يشعرون بقلق منخفض، بينما كان (41.30%) يشعرون بقلق متوسط، وكان (29.30%) يشعرون بنسبة مرتفعة من القلق.
2. أظهرت النتائج أن (24.40%) من عينة الدراسة من النساء ذوات المواليد بعيب خلقي يدركن بأنهن يتلقين مساندة اجتماعية متوسطة، وكان (33.30%) يدركن مساندة اجتماعية مرتفعة.
3. أظهرت النتائج أن (30.70%) من عينة الدراسة من النساء ذوات المواليد بعيب خلقي يتمتعن بصلاية نفسية منخفضة، وأن (33.30%) منهن يتمتعن بصلاية نفسية متوسطة، بينما كان (36.00%) من النساء يتمتعن بصلاية نفسية مرتفعة.
4. أظهرت النتائج أنه لا توجد علاقة ذات دلالة إحصائية بين قلق الحمل والمساندة الاجتماعية لدى النساء ذوات المواليد بعيب خلقي.
5. أظهرت النتائج أنه لا توجد علاقة ذات دلالة إحصائية بين قلق الحمل والدرجة الكلية للصلاية النفسية، بينما ظهرت علاقة بين قلق الحمل وبعدي الالتزام والتحدي، ولم تكن هناك علاقة ذات دلالة إحصائية بين قلق الحمل وبعد التحكم.
6. تبين أنه لا توجد علاقة ذات دلالة إحصائية بين أعمار النساء ذوات المواليد بعيب خلقي وقلق الحمل، المساندة الاجتماعية، الصلاية النفسية.
7. تبين أنه لا توجد علاقة ذات دلالة إحصائية سن الإنجاب لدى النساء ذوات المواليد بعيب خلقي وقلق الحمل، المساندة الاجتماعية، الصلاية النفسية.
8. لا توجد فروق ذات دلالة إحصائية بين متوسط تقديرات النساء ذوات المواليد بعيب خلقي على قلق الحمل، المساندة الاجتماعية، الصلاية النفسية تعزى لمتغير عدد مرات الحمل.
9. لا توجد فروق ذات دلالة إحصائية بين متوسط تقديرات النساء ذوات المواليد بعيب خلقي على قلق الحمل، المساندة الاجتماعية، الصلاية النفسية تعزى لمتغير نوع الولادة.
10. لا توجد فروق ذات دلالة إحصائية بين متوسط تقديرات النساء ذوات المواليد بعيب خلقي على قلق الحمل، المساندة الاجتماعية، الصلاية النفسية تعزى لمتغير عدد الأطفال المعاقين.
11. لا توجد فروق ذات دلالة إحصائية بين متوسط تقديرات النساء ذوات المواليد بعيب خلقي على قلق الحمل، المساندة الاجتماعية، الصلاية النفسية تعزى لمتغير القرابة من الزوج.
12. لا توجد فروق ذات دلالة إحصائية بين متوسط تقديرات النساء ذوات المواليد بعيب خلقي على قلق الحمل، المساندة الاجتماعية، الصلاية النفسية تعزى لمتغير وجود مرض مزمن.
13. لا توجد فروق ذات دلالة إحصائية بين متوسط تقديرات النساء ذوات المواليد بعيب خلقي على قلق الحمل، المساندة الاجتماعية، الصلاية النفسية تعزى لمتغير المستوى التعليمي.
14. لا يمكن التنبؤ بقلق الحمل من خلال متغيري المساندة الاجتماعية، والصلاية النفسية لدى النساء ذوات المواليد بعيب خلقي، بينما تبين أنه يمكن التنبؤ بقلق الحمل من خلال بعدي الصلاية النفسية (الإلزام، التحدي).

## التوصيات

في ضوء النتائج التي تم التوصل إليها تقدم الباحثة مجموعة من التوصيات:

1. ضرورة الاهتمام بالمرأة ذات المولود بعيب خلقي من قبل المؤسسات الاجتماعية المختصة وتقديم الدعم والمساندة الاجتماعية لتكون أكثر قدرة على تحمل الصعاب.
2. صياغة برامج إرشادية هادفة للتخفيف من حدة القلق لدى المرأة الحامل وتنقيفها بكيفية التعامل مع حملها.
3. صياغة برامج إرشادية هادفة لتوعية الأسرة بمتطلبات المرأة الحامل وسبل توفير الدعم الاجتماعي لها، خاصة النساء من ذوات المواليد بعيب خلقي.
4. تصميم برامج إرشادية هادفة لرفع مستوى الوعي الصحي والنفسي للنساء الحامل ذات المولود بعيب خلقي.
5. العمل الجاد على تعزيز دور الأسرة في دعم وتذليل العقبات ومشاكل الحمل والولادة.
6. ضرورة توفير إحصاءات تراكمية حول المعاقين وأمهم لتسنى للباحثين الإقبال على مثل هذه الدراسات.
7. تطوير المؤسسات والمراكز التي تعتني بالنساء ذات المواليد بعيب خلقي وتعزيز قدراتها.
8. توصي الباحثة المؤسسات الاجتماعية بضرورة عقد ورش عمل وندوات تنقيفية للمرأة الحامل وأسرتها، وكيفية التعامل معها فترة الحمل وبعد الولادة، خاصة لذوي المواليد بعيب خلقي.
9. ضرورة الاهتمام بتعليم الفتيات لما له من أثاراً إيجابية على حياتها الأسرية وقدرتها على التعامل مع المشكلات والضغوط النفسية.
10. ضرورة الحرص على والابتعاد عن زواج القرابة، لما له من تأثير في الإعاقة، حيث تعتبر الوراثة والقرابة من الزوج أحد أهم أسباب الإعاقة.
11. توفير مراكز دعم متخصصة للمرأة الحامل والعمل على حل مشكلاتها، خاصة لفئة الحوامل ذات المواليد بعيب خلقي.
12. ضرورة توفير زيارات دورية للمرأة الحامل ذات المولود بعيب خلقي لمختص وداعم نفسي في عيادات وكالة الغوث الدولية والعيادات التابعة للحكومة.
13. تنفيذ زيارات ميدانية من قبل داعمين ومختصين نفسيين واجتماعيين لهذه الشريحة.

# **Relationship between Mental Health and Self Esteem Among Mothers of Children with Mental Disability in Gaza Governorates**

by:

**Mohammed Zaki Abo Rokba**

Supervised by:

**Dr. Anwar AL-Abadsah**

*Assistant Professor – Islamic university  
university*

**Dr. Yehia Abed**

*Associate Professor – ALQuds*

*Islamic University of Gaza  
2013*

## **Abstract**

The overall aim of this study is to understand the relationship between self esteem and mental health among mothers of children with mental disabilities, to determine the level of self esteem and the level of mental health, and to explore the effect of some socio-demographic variables, such as mothers educational level, mothers chronological ages, children chronological ages, and children gender, on the level of self esteem among mothers. It is analytical descriptive study for 165 mothers of children with mental disabilities in three local nongovernmental societies, Khan younis rehabilitation society, Shamis society for care of the handicapped in Gaza town and Nuseirat social and training rehabilitation association. Self esteem tools were used to measure self esteem, and SCL-90-R was used to measure mental health. The results revealed low level of mental health among mothers of children with mental disability (29.07%) and high level of self esteem (60.81%), and the total level of psychological symptoms is (71.93%). The current results indicate that there are various factors that play positively in improving self esteem level among mothers of children with mental disability as culture, family support, spiritual support, and social support. Also, shows that the correlation coefficient between the level of mental health among mothers of children with mental disability and their level of self esteem equals 0.706 and the p-value (Sig.) equals 0.000. The p-value (Sig.) is less than 0.05, so the correlation coefficient is statistically significant at  $\alpha = 0.05$ , eW ocnoc eW tnWcW Wnettt e teine eoent negative relationship between the level of mental health among mothers of children with mental disability and their level of self esteem and showed that there is significant difference among the respondents regarding to these fields due to Education level of mother. Conclusions of the study are that the respondents' Education level of mother has significant effect on these fields.

Preparatory and less respondents have higher than other Education level of mother group, The study highlighted the importance of establishing a comprehensive awareness program at various sectors such as schools, universities, and other local community organizations. Added to that, improvements that appear on the abilities of their children with Mental disabilities reflect positively on the adaptation and

wellbeing of mothers and other family members, thus low psycho-pathological symptoms appeared on mothers and families of children with Mental disability.

### **Conclusion:**

Great findings of the study were appeared from the results as it highlights on concentrating our efforts on the following:

The research results showed high level of total psychological symptoms which means low level of mental health and high level of self esteem among mothers of children with Mental disabilities.

The results also showed that the ten dimensions of (SCL-90-R) were ranked prospectively from the most to the least psychological symptoms as follow : obsessive compulsive, depression, additional items, anxiety, Paranoid ideation, Hostility, Interpersonal sensitivity, Summarization, Phobic anxiety and Psychotics. The researcher attributes this high level of psycho-pathological symptoms and low level of mental health either in the total psycho-pathological symptoms or in each dimension a side among mothers of children with Mental disabilities, to the availability of the comprehensive rehabilitation services that are provided at Rehabilitation societies which philosophy is consistent with the international movement in improving the life of people with disability through the provision of comprehensive habilitation services which reflects positively on care givers of children with Mental disabilities particularly their mothers and other family members.

In accordance to the knowledge and experience of the researcher on this field, Rehabilitation societies start offering such comprehensive rehabilitation services from birth to young adulthood. Such early intervention programs which provided freely and continue to adulthood, let mothers of children with Mental disabilities and other's 02 family members to get knowledge and training about Mental disabilities and participate in the activities that designed for the child, for that, mother is considered a member of the habilitation team; in addition it allows mothers to meet with each others and to exchange feelings and experiences.

Added to that, improvements that appear on the abilities of their children with Mental disabilities reflect positively on the adaptation and well-being of mothers and other family members, thus low psycho-pathological symptoms appeared on mothers and families of children with Mental disability.

So, it's important to focus our attention on these mothers and trying to develop special institutions and societies for providing special care and support under professional framework.

### **Study Recommendations:**

#### **Practical recommendations:**

1. Establishing a data base program at all Gaza Strip to research the actual number of children with Mental disability.
2. Insisting ministry of health to record and numerate the children who born with Mental disability, which will help in determining the number of born children

with Mental disability every 1000 live birth child and comparing this rate with the international rate.

3. Establishing community awareness program to support the families and their children with Mental disability, which will help in accepting them by people and deal with them normally.
4. Supporting the policy of the Rehabilitation Societies in providing comprehensive habilitation services including training and counseling programs for mothers and family members.
5. Involving other family members particularly fathers in the follow up process, and considering parents meetings with each others as a part of the Rehabilitation Societies policy.
6. Establishing an awareness program about Mental disability at governmental and nongovernmental institutions including schools and universities to support integration of children with Mental disability with other normal children.
7. Working on implementing the law of people with disabilities directly through the Palestinian legislative council to ensure quality life for them.
8. Establishing the role of mass media program for Mental disability and other people with disabilities.
9. Encouraging and supporting further studies and researches on the field of Mental disability, which will help in determining the main needs and resources for children with Mental disability and their families.

**Research recommendations:**

- 1- Self esteem among parents of children with and without Mental disability.
- 2- Additional, more robust research is required to support the present findings.

# **Evaluation of Calcium and Magnesium among Newly Diagnosed Women with Pregnancy Induced Hypertension in El-Shifa Hospital: A Case Control Study**

By  
**Adeeb M. Abu Khater**

Supervisors

**Dr. Mazen A. El-Sakka**  
*Assist Prof. Pharmacognosy Faculty of  
Pharmacy Al Azhar University-Gaza*

**Dr. Jehad El-Hissi**  
*Assist. Prof. of Public Health  
and Community Medicine  
Faculty of medicine  
Al Azhar University-Gaza*

*Al Azhar University – Gaza*

2012

## **Abstract**

Pregnancy induced hypertension (PIH) is the most common medical complication during pregnancy, which can be developed to serious complications for mother and fetus. **Objectives:** To compare serum calcium, magnesium in women with pregnancy induced hypertension and healthy pregnant women, to identify the relationship between lifestyle and PIH, to identify the relationship between socioeconomic statuses, age, body mass index and education level and the occurrence of pregnancy induced hypertension; and to provide suggestions and recommendations that would decrease in the incidence of pregnancy induced hypertension among Palestinian women. **Subjects and methods:** A hospital based case control study was carried out at the larger governmental hospital, El-Shifa Hospital. 50 newly diagnosed women with PIH and 50 healthy pregnant women were included in the study. Data was collected through direct methods that included structured interview questionnaire and biochemical information. **Results:** The results of this study have indicated that the levels of serum calcium and serum magnesium were so closed among the study population in the two groups of pregnant women. Moreover, past antenatal hemorrhage, present history of vaginal bleeding, anemia and multiple gestations, clinical signs and symptoms (headache, blurred vision, edema and epigastric pain), lifestyle (physical activity), anthropometric measurements (pre-pregnancy weight, BMI), type of water drinking were significantly related to PIH. **Conclusion:** The study contributes in highlighting the relationships between calcium and magnesium and PIH, and provides suggestions and recommendations that decrease the risk of PIH. **Recommendations:** This study has recommended to establish a policy and strategy by a decision maker in order to standardize the diagnoses criteria of PIH,

improve nutritional measuring assessment as weight, height, body mass index, weight gain and biochemical test for pregnant women in all healthcare centers, and to improve pregnant women nutritional status, further studies are needed to study independently the relationship between calcium and magnesium among pre-eclampsic and eclampsic women.

## **Conclusion and Recommendation**

### **Conclusion**

This study was conducted at El-Shifa hospital in the Gaza Strip to evaluate calcium and magnesium among newly diagnosed women with pregnancy induced hypertension (PIH) and healthy pregnant women based on case control study. It included 50 newly diagnosed women with PIH and 50 healthy pregnant women. Analysis of the study of data revealed a group of findings:

1. Serum calcium and magnesium deficiency was not significantly related to the occurrence of PIH.
2. There was no association between poverty and PIH.
3. The relationship between maternal age as marital age and PIH was not statistically significant.
4. Overweight and obesity is a strong predisposing factor for PIH.
5. Multiple pregnancies are common risk factors among women with PIH.
6. Physical activity during pregnancy is effective in lowering the risk of PIH.
7. There was inverse association between anemia and PIH.
8. Past history of antenatal hemorrhage and present history of vaginal bleeding increased the risk of PIH.
9. The results shown that water delivery was significantly decreased the risk of PIH, while mineralized, filtrated and tap water was significantly increased the risk of PIH.
10. The study also found a significant relationship between clinical signs and symptoms (headache, epigastric pain, edema and blurred vision) and PIH.
11. The results shown that the relationship between frequent foods intake and PIH was not significant.
12. The results also shown that the relationship between diet (number of meals taken daily, meals usually skip, favorite type of bread) and PIH was not reached to be significant.

### **Recommendation**

Pregnancy induced hypertension (PIH) is considered a serious problem, associated with medical, familial, obstetric and nutritional history. It can be developed to serious complication for mother and fetus, so the researcher summarized the following recommendations:

#### ***Recommendation to policy makers***

1. To standardize the diagnostic criteria of PIH, taking in consideration the blood pressure measure from the first visit of pregnant.
2. Early booking and pregnant women regular visits should be encouraged which allows early screening, detection and management of complicated pregnancies with PIH.
3. A specialized unit within the MCH clinic should be established for nutrition counseling and increase the community awareness about the high association between obesity and the prevalence of PIH.
4. Meal plans for pregnant women affected with PIH should be prepared by a qualified nutritionist, and should be individualized for each case taking into consideration specific body characteristics for each pregnant woman.
5. Educational programs to improve the mother nutritional status should be individualized according to the education level of pregnant women.
6. Home visits for pregnant women may be helpful to make nutritional assessment, offer nutritional programs, advices, counseling and education especially for those who did not attend to the primary health center.
7. Improve nutritional measuring assessment as weight, height, body mass index, weight gain, biochemical tests for pregnant women in all healthcare centers in order to improve pregnant women nutritional status.
8. Designing a small booklet containing tables of different types of food and beverages and its amount for pregnant women.

# **Efficacy of Measles, Mumps, Rubella and Pertussis Vaccination in Children from Gaza, Palestine**

By  
**Hind Mahmoud Al Qatawy**

Supervisor  
**Prof. Dr. Mohammad Shubair**                      **Dr. AbdelRaouf EL-Manama**

*The Islamic University-Gaza*  
2014

## **Abstract**

Vaccination is a preventive strategy in fight against some infectious diseases and it is one of the most effective weapons of health protection of the modern medicine. Hence, it is necessary to continuously monitor the efficacy of vaccination programs.

**Objective:** This study focused on the evaluation of effectiveness and usefulness of vaccination against measles, mumps, rubella and pertussis in different age groups in Gaza Strip.

**Method:** Blood samples were collected from 184 children below 13 years of age, 91 males and 93 females, children were classified into 4 age groups, (2-4y), (5-7y), (8-10y) and (11-13y).

Measles, Mumps, Rubella and Pertussis antibodies were measured in serum samples using Enzyme Linked Immunosorbent Assay (ELISA).

A permission from the local Helsinki committee was obtained to ensure compliance with Ethical guidelines.

Data were analyzed using SPSS version 17.0. The results were significant if P value was  $<0.05$ .

**Result:** The study showed that the efficacy of Measles, Mumps, Rubella and Pertussis vaccination among children below 13 years in Gaza was 70.5%, 68.2%, 96.1% and 66.9% respectively, with a significant difference in efficacy among age groups except pertussis.

**Conclusion:** There was no significant difference between male and female in vaccine efficacy. This study indicates that vaccination is highly effective for rubella while it is less effective for measles, mumps and pertussis, which means that vaccine gives a short term protection, antibody level and vaccine efficacy decline overtime and there is a need for booster dose.

**Key words:** *measles, mumps, rubella, pertussis, vaccination, Gaza-Palestine*

## **Conclusion**

Finally we conclude that the efficacy of Rubella vaccination among children below 13 years in Gaza is very high (96.1%), while that of Measles, Mumps and Pertussis was little lower (70.5%, 68.2%, 66.9%) respectively. Although, efficacy for measles, mumps and pertussis is lower but it's valuable, this indicates that vaccination against measles, mumps, rubella and pertussis has an important role in protection against diseases. On the other hand, we can recognize that vaccination efficacy and antibody

levels in older children is lower than the younger ones, this could be noted clearly from the significant difference between the age groups, furthermore, relatively low antibody levels were elicited by primary immunization, which means that vaccine may not give a long term protection; hence, children over of 13 years need a booster dose.

In addition, our study shows that there is no significant difference between male and female in efficacy. This means that the effect of measles, mumps, rubella and pertussis vaccination in both sexes is the same.

### **Recommendations**

1. It's necessary to give a booster dose at the age of 13-14 years.
2. There is a need for serologic monitoring of the whole vaccination program in Gaza Strip due to the instability of sociopolitical conditions which affect the validity of vaccines.
3. Other studies should be conducted to cover other age groups to determine where we stand from herd immunity.
4. Continuously monitor the cold chain preservation

# **Mortality Trends of Congenital Anomalies among Infants in Gaza Strip from 2001-2010**

**By**

**Linda Ali Hassan Al-Najjar**

Supervisor

**Dr. Yehia Abed, Dr.P.H.**

*Associate Professor of Epidemiology- School of Public Health*

*Al-Quds University*

*2013*

## **Abstract**

**Background:** Infant mortality is important measure of health status because it both indicates the current health status of population and predicates the health of the next generation. Congenital anomalies are the leading cause of infant mortality in developing and developed countries. The etiology of congenital anomalies is not fully understood. The prevalence of congenital anomalies varies from one country to another and even in the same country from one region to another across the time.

**Aim:** The aim of this study is to identify the mortality trends of congenital anomalies among infants in Gaza strip from 2001-2010.

**Methodology:** Quantitative descriptive design was conducted, census review for all available infant death notification certificates in the last ten years to describe the mortality trends of congenital anomalies among infants. Data was collected from health management information center. Special designed abstract sheet was used as research instrument.

**Results:** The results shows that the missing data was found in place of death that represents 76.8% and the followed was death region 69.7%, name 6.8% and sex were 6.9%. The average trend of infant mortality rate during ten years was 20.03/1,000 live births. The incidence of infant deaths among males is higher than females (54.3% vs. 45.7%). The first leading cause of death among infants was prematurity with a percentage 27.3% while the second leading cause was congenital anomalies with a percentage 26.6%. The trends of congenital anomalies mortality was fluctuated; in the first five years (2001-2005) increased from 3.2 to 5.1/1000 live birth; while there has been a marked rise in 2006 and 2007 reaching 8.5/1,000 live births in 2006 and 7.1/1,000 live births in 2007. After 2007 the trend declined gradually from 5.2, 5 and 3.7 in 2008, 2009, and 2010 retrospectively. The total prevalence of congenital anomalies mortality during the ten years was 5.2/1,000 live births. The incidence of congenital anomalies mortalities among males was higher than females during seven years (53.3 vs. 46.7). The highest rate of congenital anomalies death reported during

the early neonate group, which represent 2.6 deaths/1,000 live births. The highest mortality rate was in Rafah 6.3 per 1,000 live births, followed by KhanYunis 5.9 per 1,000 live births. About one-third of congenital anomalies mortality was congenital heart disease with percentage 24.7%.

**Conclusion:** The infant mortality rate was fluctuated around 20 per 1000 live births through ten years. Congenital anomalies were the second cause of infant mortality. Male was higher than female to die from congenital anomalies and deaths increased at early neonate period. The most common type of congenital anomalies was congenital heart disease followed by neural tube defects. **Recommendations:** increase awareness about the importance of death notification certificates data, and adopting prevention strategies to decrease mortality and morbidity from congenital anomalies.

## **Conclusion and Recommendation**

### **Conclusion**

IMR is widely accepted index of the over all of the population. It used to compare the standers of health and care in different countries (UNICEF, 2008). CAs are the leading cause of infant mortality and one of the leading causes of death for young children in developed and developing countries. CAs is now making a proportionally bigger impact on the health of world children. CAs is global problem, but their impact on infant death is particularly severe in middle and low-income countries (CDC, 2011).

The purpose of the study is to identify the mortality trends of CAs among infants in Gaza strip (2001-2010) to help the decision makers to identify intervention policies to minimize the problem. Census review was done for all available infant death notification certificates in HMIC. Data was collected by abstract sheet as a research instrument, which included personal, demographic, and cause of death variables.

The study results show that there is a serious problem regarding the documentation of death notification certificates in the personal and demographic section, and cause of death section. The results shows that the most missing data was found in place of death which represent 76.8% this mean that only 2275 infant with a percentage 23.2% was recorded place of death, and the followed missed data found in the variable death region which a percentage 69.7%. The two variables name and sex are the most chance of documenting where the percentage of missing data for both (6.8% vs. 6.9% respectively).

Regarding IMR, the results show that the average trend of IMR during ten years was 20.03/ 1,000 live births. In 2001, the IMR was the highest compared with other years, which represent 22.6 per 1,000 live births. Its trend decreased in 2002, 2003, and 2004 (19.09- 19.8- 19.8 respectively). In 2010, IMR declined which represent 17.08 per 1,000/ live births. The incidence of infant deaths among males was higher than the incidence of infant deaths among females during ten years (54.3 vs. 45.7). The difference between males and females reaches to statistically significant level Chi square=32, df =9, p value<0.001. The highest incidence of death reported during the

early neonate group, which represent 9.9 per 1,000 live births followed by post neonate 6.2, and the lowest representing the late neonate group with a rate 3.5 per 1,000 live births. And the majority of infant deaths concentrated in Gaza city with a percentage 41% followed by Khanyounis with a percentage 18.7%, North Gaza with a percentage 16.2% and the lowest concentrated occur at Mid-zone and Rafah (12.4%-11.7% respectively). The first leading cause of death among infant during ten years was prematurity with a percentage 27.3% while the second leading cause was CAs with a percentage 26.6%

Trend of CAs varied and changed from years to year. In the first five years (2001-2005) the trends of CAs mortality fluctuated from 3.2 to 5.1/1,000 live births, marked increasing was in 2006 that reached to 8.5 followed by 7.1/1,000 live births in 2007. Then the infant mortality due to CAs declined gradually 5.2, 5, and 3.7 in 2008, 2009 and 2010 retrospectively. The infant deaths due to CAs among males were higher than infant deaths among females during seven years (53.3 vs. 46.7). The study result shows that the relationship between CAs mortality and infant sex reached to statistically significant level in 2006 (59.0 vs. 41.0). OR was 0.69 with 95% CI (0.50-0.95) and p value 0.020.

CAs mortality during the first years of age reported in GS was 2012 infants during period 2004-2010. The study results showed that the highest rate of death reported during the early neonate group, which represent 2.6 deaths/1,000 live births followed by post neonate 1.9 deaths/1,000 live births, and the lowest representing the late neonate group with rate 1.0 deaths/1,000 live births.

Half of CAs not specified which represent 51.6%. About one-third of CAs mortality were CHD with percentage 24.7%, NTDs represent 7.3%, gastrointestinal anomalies represent 4.3%, down syndrome 4%, skeletal anomalies 3.9%, and Urogenital represent 2.8%.

The highest rate of CAs mortality reported in Rafah 6.3/1.000 live births, followed Khanyonis 5.9/1.000 live births by Mid-Zone 5.8/1.000 live births, Gaza city 5.6/1.000 live births and the lowest rate reported in North Gaza 5.1/1.000 live births. The incidence reported number of CHD increased by years from 2004, 2005, 2006 (58-65-86 respectively). After 2006, the number decreased in 2007 and 2008 that registered 58 infant deaths. After 2008, CHD numbers increased in 2009 and 2010 that account 80 cases in each year.

From 2004 to 2010, there are 1139 infant deaths register as CAs without specified the cause of death. The incidence number reported higher in 2006 and 2007.

## **Recommendations**

Through the study findings, the researcher can provide a number of recommendations

1. Conduct continuous training for non-specified workers about data entry and data coding. Training how is keeping database in proper way.
2. Conduct continuous training for physicians on the accurate steps of completing death notification certificates in hospitals.

3. Increase awareness about the importance of health information among all professions to identify priority.
4. The policy makers should have adopting strategic plan for monitoring the incidence of congenital anomalies.
5. Increase awareness about risk factors of congenital anomalies among mothers.
6. Primary prevention program as health education, preconception counseling and folic acid supplementation could be encourage reducing CAs particularly those related to high-risk criteria through modifiable risk factors as life style, obesity, smoking, diabetics, and other maternal diseases. Also, should enhancing secondary prevention measurements as screening and diagnosis procedures to reduce excessive mortality and disability.

#### **Future research recommendations**

1. Further studies needed to investigate the proper recording and documentation of death notification certificates.
2. Further researches needed to identify the risk factors of CAs in GS that help decision makers to identify preventive strategies.
3. Other studies should be applied to investigate the relationship between abortion and CAs.
4. More research needed to support this study results.

# **Nutrition Assessment of Palestinian Children Less than Three Years Old with Rickets in Gaza Strip**

By

**Rula F. Abu Zuaiter**

Supervisors

**Dr. Jehad H. Elhissi**

*Ass. Prof. of Public Health  
Health Consultant*

**Dr. Mazen A. El Sakka**

*Ass. Prof. of Pharmacognosy  
Al-Azhar University*

*Al Azhar University – Gaza*

*2011*

## **Abstract**

Nutritional rickets is a disorder of growing children due to defective mineralization of newly formed bone matrix because of vitamin D deficiency. Vitamin D is made available to the body by photosynthesis in the skin (endogenous vitamin D from ultra violet ray exposure) and from dietary intake (exogenous vitamin D from dietary or specific supplementation). Vitamin D deficiency remains the major cause of rickets among young infants in most countries, because breast milk is low in vitamin D and its metabolites and social and religious customs climatic conditions often prevent adequate ultraviolet light exposure, Without vitamin D supplementation for the baby, prolonged exclusive breastfeeding, lack of sunlight exposure inappropriate dietary intake and poor housing would contribute to the development of rickets. The present study was undertaken to understand the nutritional status and its role in increasing rickets in Palestinian children under three years old in the Gaza Strip to determine to identify the nutritional determinants contributing to the development of nutritional rickets in children less than three years old, identify the role of the socioeconomic factors in development of nutritional rickets and to raise recommendations for policy makers to regulate a public health policy to increase surveillance and limiting the growth of the disease. A case-control study was conducted from July 2009 to October 2010, 200 children aged from 6 to 36 months participated in the study, 100 were rachitic children (the case group), and the other 100 were healthy children (the controls group) using several parameters, anthropometric measurements, such as height, weight, head circumference, body mass index BMI, height for age (Stunting), height for weight (wasting) and laboratory analysis, like serum albumin, serum calcium, serum phosphate and serum alkaline phosphatase. To assess their dietary intake, food frequency questionnaires FFQ were taken for the children from their mothers or care-giver. The present study showed that 53% of the rachitic children were poor, 59% were males, And 41% were females, the mean height for rachitic children was 79.85cm less than the mean height of controls which was 82.7cm, the

mean weight for cases group was 10.82kg lower than that of controls 11.66kg, with higher mean for head circumference for the cases group 47.53cm than of controls 45.9cm, most of diseased children had normal serum calcium level, serum albumin, hypophosphatemia, and high levels of alkaline phosphatase. Prolonged exclusive breastfeeding and lack of sun exposure were having strong evidence on the development of the disease, cases group were not taking sufficient amounts of food contains high amount of calcium and vitamin D and they were malnourished, also taking of calcium and vitamin D supplementation during pregnancy and breastfeeding had an important effect on mothers and their infants.

## **Conclusion and Recommendations**

### **Conclusion**

This is a case-control study which was conducted in the Gaza Strip to understand the nutritional status of the mothers and children under three years old diagnosed with rickets, many nutritional determinants were contributing to the development of nutritional rickets in the Palestinian community and these determinants are:

#### **1- Maternal nutritional determinates**

1. Slightly more than two thirds of rachitic mothers were suffering bone pain, while mothers of normal children are rarely suffering from bone pain.
2. About a quarter of women of rachitic children were taking calcium supplements while three quarters of the mothers of healthy children were taking calcium supplements.
3. Poor dieting of the mother either in the preparatory state in adolescence or in pregnancy is strongly associated with the disease, also fear of obesity in adolescence and mothers
4. These determinants are the inadequacy of diet during adolescence, pregnancy and lactation, reproductive age, poor health of the mother, all these factors replenish mother stores of calcium and vitamin D.
5. Child order and number of pregnancies may have a role in the development of nutritional rickets, but also, western diet and fast food, lack of vitamin D supplementation, and avoidance the exposure to sun lights all these factors were associated with vitamin D deficiency and development of the disease in their children.

#### **2-Child nutritional determinants**

1. Most rachitic children were fragile and had many health problems like respiratory infections, urinary tract infections, poor weight, and poor height.
2. The latency in starting complementary feeding with lack of fortified food or vitamin D supplementation, also lack of high quality of food stuff (meat, fish, eggs, fortified cereals, olive oil, milk and milk products, nuts) are associated with the development of the disease.
3. Rachitic children were prolonged exclusive breastfed with starting complementary feeding later than healthy children which increase their susceptibility to the disease.
4. The height, weight, and BMI for the rachitic children were lower than those of controls and the only variable head circumference was higher than it of controls.
5. Many of rachitic children were suffering one type of food intolerance.

### **House hold determinants**

1. Low level of education was associated with increase the development of the disease, a small percentage of parents of rachitic children were educated.
2. Low socio-economic status of the families of rachitic children was strongly associated with increase the development of the disease most of the families their monthly income was less than 2000 NIS.
3. Two third of the children with rickets were poor and their daily income per capita was less than 2 dollars.
4. Poverty reinforces poor dieting for the mother and the child, also will prevent or delay the referral to a pediatrician who will ask for many laboratory tests and x-rays for diagnosis of the disease, as well as difficulty in bringing any drugs or supplementations for treatment.
5. About half of the rachitic children families were taking aids from another associations or community members.

### **Environmental determinants**

1. Lack of sun exposure in infancy with increase clothing was associated with increasing rickets in children.
2. Instead of our shiny Arabic area, rickets still in development as the study showed.

### **Recommendations**

Increasing prevalence of nutritional rickets in the Middle East, in case of abundance sun lights, and health education and promotion is a problem which should attract the attention of policy makers to have solutions or decreasing the development of the disease. Several recommendations are proposed from the author to eradicate the development of the disease:

1. Implementation of a continuous education program in the health care centers and clinics to increase awareness of the importance of good and healthy dieting during adolescence as a preparing stage for pregnancy and breastfeeding, and understanding of the major health consequences for micronutrients deficiencies.
2. Implement a national program in the clinics for vitamin D supplementations for both mothers and children and a specific follow up program for distribution and utilization of vitamin D supplementation.
3. Increase health education and promotion for the importance of healthy sun exposure, proper infant clothing, quality of housing conditions, and traditional habits of short pregnancy interval.
4. Increase community awareness of the fortified food like fortified cereals, milk and biscuits for their children, as well as increasing mother awareness of the development milestones of rickets and the importance of continual follow up.
5. Further researches are needed to determine the prevalence of calcium and vitamin D deficiency among mothers and adolescents to evaluate and predict the future of the disease development.

# **Incidence of Enteric Pathogens Causing Community Gastroenteritis among Kindergarten Children in Gaza Governorate**

By  
**Rohaifa Jaber AL- Haddad**

Supervisor  
**Dr. Fouad Ridwan**

Co- supervisors  
**Dr. Nahed Al Laham**  
**Dr. Mansour Elyazji**

*Al-Azhar University – Gaza*  
*2011*

## **Abstract**

Diarrheal diseases continued to be a common and costly problem. Gastroenteritis considered as one of the leading causes of illness and death in children under five-year old especially in developing countries. It is also one of the leading causes of deaths among the population in Gaza strip.

The present study conducted to investigate the incidence of different enteric pathogens causing community gastroenteritis among kindergarten children in Gaza governorate. The study was cross sectional case control study and population included both symptomatic (diarrhea) with suspected community gastroenteritis children who are considered as cases and asymptomatic healthy (no diarrhea) children who are considered as controls from both genders from kindergartens distributed in all parts of Gaza governorate. One hundred fifty stool and blood samples were collected, divided into 96 cases and 54 controls. The collected stool samples were investigated for parasitic, viral, and bacterial pathogens at Al-Azhar microbiology laboratories using standard microbiological and serological procedures.

However, blood collection, testing for complete blood count (CBC), serum iron (SI) and total iron binding capacity test (TIBC) were performed at the Palestinian medical relief society laboratory.

Out of the 150 study population, the overall percentage of positive stool samples with a known enteric pathogen was 60.6%. The incidence of different enteric pathogens causing community gastroenteritis in diarrheal cases was significantly higher than in non-diarrheal controls (88.5%, versus 11.1%). The most prevalent enteric pathogens isolated were *Entamoeba histolytica* and *Giardia lamblia* (28%, 26.7% respectively), where they found to be significantly higher than the prevalence of other enteric pathogens.

*Rotavirus* was found in 3.1% of diarrheal stool samples (cases) but not detected in nondiarrheal stool samples. However, adenovirus types 40 and 41 weren't detected in all study population. The bacterial enteric pathogens *Shigella* and enterohemorrhagic

*Escherichia coli* O157:H7 (EHEC) had similar rates as rotavirus (3.1%). Meanwhile, *Salmonella* wasn't isolated.

Mixed infections with more than one pathogen were found in 7.4% of the total studied samples. Age group of 3 years old showed the highest incidence of community gastroenteritis where *E. histolytica* was the highest causative agent (75%). In age group of 4 years old, also *E. histolytica* was the highest causative agent (33.3%). Age group of 5 years old showed the highest incidence of *G. lamblia* (29.9%).

Blood parameters results revealed that 21.8% (21/96) of the diarrheal cases and 14.8% (8/54) of non-diarrheal controls were iron deficient with Hemoglobin  $\leq 11$  g/dl.

In conclusion, the parasitic etiologic agents such as *E. histolytica* and *G. lamblia* were found to be the common cause of community gastroenteritis in this population. However, low incidence of viral and bacterial pathogens was detected as causative agents of community gastroenteritis in this population. Rotavirus, *Shigella* and EHEC weren't the main causative agent of diarrhea and adenovirus and *Salmonella* weren't detected.

**Key words:** Community gastroenteritis; enteropathogens; kindergarten; blood parameters; Gaza

## Conclusions and Recommendations

This study was conducted to investigate the incidence of enteric pathogens causing community gastroenteritis among kindergarten children aged 3-5 years old in Gaza. This is the first study that dealt with this target group in Gaza city. We found high incidence of parasitic infections than viral and bacterial infections as causative agent of community gastroenteritis among kindergarten children aged 3-5 years in Gaza city.

## Conclusions

1. The present study has demonstrated that protozoan enteric pathogens, *E. histolytica* and *G. lamblia* are common parasitic causes of gastroenteritis in this population.
2. The rate of parasitic infection was higher among kindergarten children aged 3 years old. It represented 75% of the infection. It could be attributed to different factors of unfavorable bad habits and low hygiene practices.
3. In term of low incidence of viral pathogens in community gastroenteritis in this population, rotavirus wasn't the main causative agent of diarrhea and adenovirus wasn't detected.
4. Bacterial pathogens like *Shigella* and *E. coli* O175:H7 were observed with low incidence, while *salmonella* wasn't detected. Bacterial pathogens caused more severe diarrhea than parasitic infections which needed admissions to hospital.
5. Mixed infections were relatively frequent, and were in the forms of parasite with parasite, or bacterium *Shigella* with parasite.

6. Analysis of data according to age showed a significant association of the presence of enteropathogens with diarrhea in the 3 years age group than 4 and 5 years old groups.
7. No differences in the incidence of diarrhea or infection with different enteropathogens were detected between males and females.
8. Iron deficiency anemia was observed in both diarrheal and non-diarrheal samples (21.8% and 14.8% respectively), with no significant differences in the blood parameters with diarrhea.

### **Recommendations**

- 1- We recommend that hospital and private laboratories in the Gaza strip should investigate all diarrheal stool samples for *rotavirus*, and should culture routinely stool specimens on sorbitol-MacConkey agar, the standard culture medium for *E. coli* O157: H7, because children with gastrointestinal infections caused by *E. coli* O157:H7 are at risk of developing hemolytic-uremic syndrome (HUS) which can be fatal as it may lead to acute kidney failure.
- 2- Use of new techniques like PCR and immunoassay in further studies which have more quality and the sensitivity for detection of these pathogens.
- 3- Regular stool examination and follow up for the kindergarten children who are suspected of having gastroenteritis to control the wide spread of parasitic infection.
- 4- Improved hygiene, health education, access to safe drinking water is highly recommended. The practice of dumping solid wastes in the streets and rearing animals in residence areas should be minimized to reduce the incidence of these types of infections.
- 5- More investigation is needed in other areas of Gaza strip to provide basis for a comprehensive control program.

In conclusion, diarrhea is still a serious health problem in children not only in Gaza, but also nationwide in Palestine and most of developing countries. Some enteric pathogens such as *E. histolytica*, *G. lamblia*, rotavirus and *Shigella*, are the major causes of diarrhea.

This study has highlighted many of the enteric pathogens that cause community gastroenteritis in kindergarten children in Gaza. This will make the clinical diagnosis more efficient and help the pediatricians in treatment of kindergarten children with diarrhea due to community gastroenteritis.

# **The Relationship Between Stunting And Zinc Deficiency Among Toddlers Aged 1-3 Years In Gaza Strip**

By  
**Zeyad Rabeh Zakout**

Supervisor  
**Prof. Jamal M. Safi**  
*Professor of Chemistry and Toxicology of Pesticides  
Al-Azhar University- Gaza*

*Al-Azhar University- Gaza  
2010*

## **Abstract**

Zinc is an important micronutrient, which is critical for normal immune function and physical growth. Zinc deficiency is a major public health concern. Zinc deficient children are prone to infectious diseases such as diarrhea and respiratory tract infection. The main objective of this study is to find the relationship between stunting and zinc deficiency among toddlers aged 1-3 year in Gaza Strip.

A quantitative analytical retrospective case control study was chosen. The study subjects consist of two groups. The first group included 137 case samples (stunted toddlers) who were collected from Ard El Insan Palestinian Benevolent Association centers in Gaza city and Khan-Younis city. The second group was 121 control samples (non-stunted toddlers) were collected from primary health care clinics at the Ministry of Health (MOH) and United Nations Relief and Works Agency for Palestine Refugees (UNRWA) in all governorates of Gaza Strip. They were interviewed by using questionnaire designed for the study and anthropometry and serum zinc level for case and control subjects were examined.

The study illustrated that, there is a strong relationship between zinc deficiency and stunting (height-for-age) of study subjects, (70.1 %) of study subjects who had height-forage less than -2 SD (stunted subjects) had zinc deficiency, while (88.4 %) who had heightfor- age more than -1 SD (non-stunted subjects) had normal serum zinc level (SZL) ( $P = 0.000$ ), ( $OR = 17.895$ ), ( $CI = 9.191 - 34.844$ ).

Stunted male children had a high percentage of zinc deficiency (72.2 %), while stunted female who had zinc deficiency were (67.7 %). A high percentage of zinc deficiency (73.8%) was found in stunted children in the third year of life (25- 36 months). Gaza governorate had a high percentage (77.3 %) of stunted subjects with zinc deficiency, while (75 %) of stunted subjects with zinc deficiency were lived in refugee camps. The study also revealed that, the low educational level of mother was associated with zinc deficiency ( $P = 0.037$ ), whereas there is a positive statistical association between crowding at home and zinc deficiency ( $P = 0.032$ ), ( $OR = 0.279$ ),

(CI= 0.082- 0.948). The study showed that, the poverty had a serious effect on stunting. It was clarified that, there is statistically significance between monthly income and zinc deficiency among case subjects (P= 0.015), (OR= 2.837), (CI= 1.204- 6.686).

From 110 stunted children who were weaned, it was found that, (74.5 %) of them had zinc deficiency. There is a statistical significant difference between weaning and zinc deficiency (P= 0.021), (OR= 0.368) and (CI 0.154 – 0.876). On other side, it was cleared that, eating habit played an important role in SZL. Poor and fair appetite was associated with zinc deficiency in case and control subjects (P = 0.013), (P = 0.000), respectively.

Daily frequent meals were associated with normal zinc level among control subjects (P= 0.000), (OR= 6.955), (CI= 2.117- 22.849). Eating frequency of snacks related statistically to zinc deficiency in case and control subjects (P= 0.026), (OR= 2.316), (CI= 1.098- 4.884) and (P= 0.032), (OR= 3.580), (CI= 1.055- 12.146) respectively. Data analysis showed also that, the frequency of milk drinking, meat eating and legumes eating are associated with zinc deficiency. Logistic regression clarify that there is a strong relationship between eating frequency of legumes and zinc deficiency (P= 0.000), (OR= 1.549), (CI= 1.280- 1.874).

The study illustrated that, zinc deficiency had serious effect on stunting. Statistically significant relationship between zinc deficiency and stunting was identified (P= 0.000), (OR= 17.895), (CI= 9.191- 34.844). The result of logistic regression agreed with this result. Zinc deficiency associated with recurrent episodes of diarrhea. Logistic regression had confirmed the relationship between zinc deficiency and recurrent episodes of diarrhea (P= 0.006), (OR= 0.465), (CI= 0.269- 0.802). Zinc deficiency associated with recurrent episodes of respiratory tract infection. The result of logistic regression agreed with cross tabulation results (P= 0.000), (OR= 0.220), (CI= 0.130- 0.734).

The present study contributes in highlighting the effect of zinc deficiency on stunting, recurrent episodes of diarrhea and respiratory tract infection for implementing strategies that could help in reducing zinc deficiency and its complications.

## **Conclusion and Recommendations**

This chapter provides the main conclusions of this study as well as some recommendations for decision makers for adopting new strategies to reduce zinc deficiency and stunting.

Recommendations studies for further investigation are also mentioned in this chapter.

## **Conclusion**

Zinc deficiency is a major public health concern. Since there is no previous research about SZL and stunting conducted in Gaza Strip, this study was carried out to answer this question and to find out if there is a relationship between zinc deficiency and stunting among toddlers aged 1-3 years in Gaza Strip.

Data were collected by face to face questionnaire from 258 mothers of children aged 1-3 years. Weight and height for all subjects were measured by the researcher himself and the results were entered to WHO anthro, (2007) software to calculate Z- score of height-for-age, weight-for-age and weight-for-height. A total of 258 blood samples were collected [137 blood samples were collected from stunted children and 121 blood samples were collected from non-stunted children].

1. There is a strong positive correlation between stunting and zinc deficiency. The majority of stunted children (70.1%) had zinc deficiency, while the high percentage (88.4 %) of non-stunted children had normal zinc level. These results emphasize that, zinc deficiency play a serious role as the cause of stunting in Gaza Strip. The results also revealed that there is no clear relationship between underweight and zinc deficiency, while there is statistical relationship between wasting and zinc deficiency.
2. The study demonstrated that the high percentage of zinc deficiency was found in male stunted children (72.2 %), and in stunted children who aged 25-36 months (73.8 %). Clear variations were found in distribution of stunted children who had zinc deficiency according to their living side. The majority of them (77.3 %) lived in Gaza governorates, while the high percentage (75 %) of stunted children, who had zinc deficiency lived in refugee camps.
3. The study showed that (81.2 %) of stunted children who had zinc deficiency had mothers learned less than 6 years, which indicates the strong association between the level of mother education and SZL.
4. There is positive association between crowding at home and zinc deficiency.
5. Relationship was found between serum zinc level and kind of father employment.
6. The family income has effective role in zinc deficiency.
7. No statistical significant differences were found between environmental factors (source of drinking water, storage of drinking water, presence of municipal sewage) and SZL.
8. A positive relationship was identified between being still breastfeeding and serum zinc level, 74.5 % of stunted children who were weaned had zinc deficiency.
9. Child appetite affects serum zinc level. All stunted children who had fair appetite were zinc deficient.
10. There is positive correlation between number of daily meals and daily snacks and serum zinc level.
11. There is strong relationship between increase the number of frequency of milk drinking, frequency of meat eating, frequency of fish eating and normal SZL.
12. The study demonstrated a strong and statistically significant relationship between eating frequency of legumes and zinc deficiency.
13. A strong relationship was identified between zinc deficiency and recurrent episodes of diarrhea. Also the study exhibited that, zinc deficiency affects on the duration of diarrhea.
14. A strong relationship was identified between zinc deficiency and recurrent episodes of RTI. (78.8 %) of stunted children with zinc deficiency had more than

8 episodes of RTI yearly. Also the study exhibited that, zinc deficiency affects on the duration of RTI.

15. Logistic regression was performed to examine the result of eating frequency of legumes, stunting, recurrent episodes of diarrhea, and recurrent episodes of RTI and zinc deficiency. Logistic regression values agree with cross-tabulation.

### **Recommendations**

1. The study provided clear evidence of widespread of zinc deficiency among stunted children in Gaza Strip. There is suggestive evidence that zinc deficiency has important negative effects on health of children. Policy makers were advised to develop interventions to improve zinc status of the population with emphasis in the sub-populations with higher risks: rural areas, the poorest children and women.
2. Using nutritional surveillance which done in nutritional department in MOH to reduce prevalence of stunting and its future complications.
3. MOH should be encouraged to use the techniques and indicators currently available for the assessment of SZL for stunted children and other risky groups.
4. Policy makers should collect specific information on population zinc status and should use information to develop appropriate intervention programs.
5. The results of this study should be used to plan for interventions aimed to improve the zinc status of the children.
6. Using planned strategies for food security and food assistance to ensure balanced food.
7. Create units in primary health care centers to treat malnutrition problems.

### **Recommendations for future research**

1. Further studies are needed to explore the prevalence of zinc deficiency among children under 5 years in Gaza Strip.
2. Further studies are needed to estimate the cost of screening serum zinc level and routinely provided zinc supplementations.
3. Specific research is recommended to investigate the risk factors associated with recurrent episodes of diarrhea among children under 5 years old in Gaza Strip.

# Iron Deficiency Anemia Among Kindergarten Children Living in Marginalized Areas in Gaza Strip

by  
**Abdallah R. Yaghi**

Supervisor  
**Dr. Mahmoud Sirdah**

*Al-Azhar University – Gaza*  
*2013*

## **Abstract**

**Background:** Iron deficiency anemia (IDA) is the most common type of nutritional anemias, and is recognized as an important health problem in Palestine. Large numbers of children are suffering from IDA according to previous studies. These studies revealed that the nutritional status of the Palestinian children in the West Bank and Gaza is seriously deteriorating due to the prevailing political situation in the area.

**Objectives:** this study was conducted to estimate the prevalence of IDA among kindergartens' kids living in the marginalized areas in Gaza Strip, to evaluate the level of knowledge, awareness and practices of the parents of the study population regarding the importance of iron on children health. Moreover, the study aims to identify the possible risk factors of IDA among the study population, and to evaluate the effectiveness of oral iron formula (ferrous carbonate 50mg + 100mg vitamin C /5ml) in improving the hemoglobin level in the anemic children.

**Material and method:** this is a cross sectional study included 735 kids ( 384 males & 351 females) distributed in 11 kindergartens. Data were collected by a questionnaire, body weight and height of the study sample were also measured. Complete Blood Count (CBC) were measured using cell dyne 1700 electronic counter (Sequoia-Turner Corporation, Santa Clara, CA). The presence of IDA was considered in the microcytic (MCV <80fl) children through the Mentzler mathematical formula  $MCV/RBC > 13$  concomitant to reduced hemoglobin concentration < 11.5g/dl. All IDA children were managed by oral iron supplements, and were checked again for the same parameters of CBC after 3 months of starting the treatment regimen.

**Result:** The overall prevalence on IDA among the screened children in the marginalized areas was 33.5% (246: 135 M & 111 F), with no significant differences among males (35.2%) and females (31.6%). The majority (68.8%) of the screened kids in the marginalized areas are registered refugees at United Nations Relief and Works Agency (UNRWA). Significantly different prevalences of IDA were reported

among the different governorates with highest values reported in Rafah (41.2%) and the Middle (36.2%) governorates.

Also significantly higher prevalence was reported among refugee camp kids (46.4%) as compared to rural (30.9%) and city (31.5%) children. The results also indicated non-significant differences between the numbers of families regarding parents' consanguinity either in the anemic cases or in the overall cases. In regards to the nutritional habits, most of the kids had good nutritional habits with no significant differences between the anemic

and the control groups, as the  $P$  value  $> 0.05$ . Also, It's noticed that most of them had full term pregnancy and natural vaginal delivery. Most of the cases don't suffer from malnutrition, parasitic infection, chronic or frequent diarrhea, nor any diseases. Most of their families don't suffer from any genetic diseases while most of the cases received multivitamins or iron in the last two months of pregnancy. Regarding the anthropometric and socioeconomic characteristics of the cases, there were statistically significant differences between the cases and the normal control in age and height, where the  $P$  value  $< 0.05$  and no statistically significant differences were noticed in the other parameters. The results revealed also significant differences between the two groups in all the CBC parameters except for WBC. It was very clear that there were high statistically significant differences between cases before and after treatment in the hematological parameters, except for MCV where the differences were not significant.

### **Conclusion**

This study concluded that more than one-third of the study sample suffering from IDA which significantly affects the growth of children. regarding the risk factors, living in the southern of Gaza Strip and living in refugee camps and the rural areas are considered to be the most important risk factors of IDA. The study also showed that most of the study subjects have good nutritional habits, and this reflects the high education of their parents. Therefore, the study recommends that there is an urgent need to assess the nutritional status of children of school age and replenish their body iron via iron supplements and iron fortified foods to improve their level of hemoglobin.

**Keywords:** *Iron deficiency anemia; Risk factors; Marginalized; kindergartens; Gaza strip*

### **Conclusion and Recommendations**

This chapter provides the main conclusions of this study as well as some recommendations for decision makers for adopting new strategies to reduce iron deficiency anemia. Recommendations studies for further investigation are also mentioned in this chapter.

## Conclusion

1. The prevalence of IDA among kindergarten children living in marginalized areas in Gaza strip was about one third of the study subject, with no significant differences between both genders .
2. This study demonstrated that the highest percent of anemia was in Rafah governorate Followed by North and the Middle, whereas, the lowest percent was in Gaza governorate .
3. This study showed that more than half of anemic subjects live in rural areas or refugee camps and most of families don't earn a sufficient income that lead to saving.
4. There was no significant differences between the number of families according parents' consanguinity neither in anemic cases nor overall cases.
5. Most of parents have received a high education ( secondary and university ), where no significant differences between smokers vs non smokers.
6. Most of the children have good nutritional habits, It can be noticed that there were no statistically significant differences between the anemic and the control groups in all nutritional habits and feedings .
7. No statistical significant differences were found between normal control and anemic cases in medical history of kids` mothers (Anemia during pregnancy, Iron supplements during pregnancy, Full-term or preterm, Delivery method).
8. Concerning the medical characteristics of the study subjects it noticed that there was no statically significant differences between normal control group and anemic cases in (Suffering from malnutrition, Suffering from parasitic infection, Suffering from chronic or frequent diarrhea, Receiving multivitamins or iron in the last two months, Suffering from any diseases, Genetic diseases in the family).
9. It was very clear that IDA affected the height of anemic subjects . with high significant differences between normal control and cases.
10. The results also revealed that there is clear relationship between the age and Iron deficiency anemia , where there is significant differences between normal control and anemic cases in age.
11. There is no significant differences between normal control and cases in other anthropometric and socioeconomic characteristics (Weight of the child, Weight at birth, Father age, Mother age, Marriage years of the parents, Number of kids in the family, Family income, Family outcome and Family members living together ).
12. The study demonstrated a statistically significant differences between anemic cases and the normal control in all the CBC parameters except for WBC.
13. This study demonstrated the effectiveness of iron supplementation over 3 months of treatment , It is very clear that there were high statistically significant differences between cases before and after treatment in the hematological parameters, except for MCV where the differences were not significant.

### **Recommendation**

The study provided clear evidence that the prevalence of iron deficiency anemia among children in Gaza Strip become a disturbing .

1. Policy makers are advised to develop interventions to improve iron status of the population with emphasis in the sub-populations with higher risks: rural areas, the poorest children.
2. Policy makers may collect specific information on population iron status and should use information to develop appropriate intervention programs.
3. The results of this study may be used to plan for interventions aimed to improve the iron status of the children.
4. We recommend establishing units in primary health care centers to treat malnutrition problems.

### **Recommendations for future research**

1. Further studies are needed to explore the prevalence of IDA among school age children.
2. Specific research is recommended to investigate other risk factors associated with IDA among children under 5 years old in Gaza Strip.

# **The Association between Serum Vitamin D Levels and Anthropometric Measurements among Children from 12-36 Months Old Attending Ard El-Insan Clinics in the Gaza Strip**

By  
**Mohammed Khalil Abu Jami**

Supervisors

**Dr. Mazen A. El Sakka**  
*Assistant Prof. of Pharmacognosy*  
*Al Azhar University- Gaza*

**Dr. Luay M. Nasser**  
*Consultant Endocrinologist*  
*Medical Services*

*Al Azhar University – Gaza*  
*2013*

## **Abstract**

**Background:** Determinants of vitamin D status are of growing interest as vitamin D is now recognized to play an important role in overall health and decreases the risk of diseases such as osteoporosis, cancer, and cardiovascular disease. Understanding modifiable determinants of vitamin D status is necessary to increase the possibilities of improving vitamin D deficiency.

**Aim:** The aim of this study is to determine the frequency of deficiency and insufficiency of vitamin D in a sample of apparently healthy children aged 12-36 months in relation to anthropometric measurements and other modifiable determinants.

**Methodology:** A cross-sectional study with concurrent measurement of dietary, lifestyle and anthropometric exposures as well as 25(OH)D level was performed, in which 126 children between 12 and 36 months of age were studied at their first visit to Ard El Insan (AEI) clinics in Gaza and Khanyounis cities between April and May 2013.

**Results:** The prevalence of vitamin D deficiency and insufficiency was 37.3% and 21.4% respectively. The risk of having lower vitamin D levels was 8.6 times more in children exposed to sunlight less than 15 minutes/day when compared with children exposed to sunlight for durations more than 15 minutes/day, (OR=8.587, 95% CI=3.178-23.206). Overweight children were significantly more likely to have lower vitamin D levels (OR=12.253, 95% CI=1.383-108.589) than underweight to normal weight children. Children with dietary vitamin D intake less than 250 IU per day were 8 times more likely to have lower vitamin D levels compared to those with daily vitamin D intake  $\geq 250$  IU (OR=8.317, 95% CI=2.344-29.513). The likelihood of lower vitamin D status in children who participated in indoor activities and watched T.V. for more than 8 hours per day was significantly higher (OR=10.398, 95%

CI=1.783-60.632) relative to children who participated in indoor activities for shorter durations.

**Conclusion:** Subclinical vitamin D deficiency is commonly undiagnosed and is an unrecognized epidemic among children in the Gaza Strip. Given the results of this study, overweight, indoor activities, poor dietary intake of vitamin D and behaviors that decrease skin exposure to direct UVB radiation were associated with the vitamin D deficient state and increased the odds for vitamin D deficiency in this group of children. Therefore it may be beneficial to require a higher oral intake of vitamin D for vulnerable groups.

**Keywords:** Vitamin D, Determinants, Anthropometric measurements, Gaza Strip, Children.

## **Conclusion and Recommendations**

### **Conclusion**

In conclusion, subclinical vitamin D deficiency is commonly undiagnosed and is an unrecognized epidemic among children the Gaza Strip. Given the results of this study, and bearing in mind that symptoms of vitamin D deficiency are very subtle and often go undetected, as well as the increasing prevalence of obesity in children, vitamin D deficiency/insufficiency might be an important public health problem due not only to its effect on the growing skeleton, but because hypovitaminosis D affects other organ systems adversely.

Vitamin D deficiency and insufficiency were highly prevalent in children aged 12-36 months in the Gaza Strip. The results of this study demonstrate that overweight, indoor activities, poor dietary intake of vitamin D, and behaviors that decrease skin exposure to direct UVB radiation were associated with the vitamin D deficient state and increased the odds for vitamin D deficiency in this group of children. Milk intake was a significant moderator of vitamin D status as children who consumed  $\geq 2$  servings of milk per day did had significantly higher vitamin D status than those who consumed  $< 2$  servings of milk and those who did not consume milk at all. The current results also suggest that vitamin D deficiency may be associated with linear growth retardation in the absence of clinical rickets in children.

### **Recommendations**

1. Even though direct exposure of the skin to UVB radiation from sunlight is the main source of vitamin D in this country, it may be beneficial to require a higher oral intake of vitamin D from food sources specifically for high risk groups.
2. Because the 25(OH)D assay is costly and may not always be available, children at risk of vitamin D deficiency should be aggressively treated to prevent rickets.
3. Supplementation with 400 IU of vitamin D for infants and children who do not ingest at least 1L of vitamin D fortified milk daily.

4. Risks associated with exposure to UV Radiation (such as skin cancer) need to be balanced against the risks associated with deficient cutaneous vitamin D synthesis (rickets, immune system effects, and certain cancers), particularly if dietary intake of vitamin D is insufficient.
5. Recommendations for fortification of commonly used foods with vitamin D are necessary in keeping with various cultural norms of food intake and geography
6. For children, being outdoors for short periods of time (15-30 minutes) at least two or three times per week without sun protection will provide them with their vitamin D requirement.
7. Health education programmes to improve nutritional knowledge of vitamin D among parents and practitioners and the importance of sunlight exposure in the prevention of vitamin D deficiency.
8. Education and training to improve knowledge of public health professionals about vitamin D deficiency among vulnerable groups are needed.
9. Intervention to improve access of families with infants to food sources rich in vitamin D precursors and to improve compliance with nutritional advice.

**In depth Analysis of Risk Factors for Coeliac Disease Amongst  
Children Under 18 Years Old in the Gaza Strip,  
A Cross Sectional Study**

By  
**Mohammed B. Al-Raee**

**Supervisor**  
**Dr. Mazen A. El-Sakka**  
*Head of Pharmacognosy Dept*  
*Assist. Prof. of Pharmacognosy*  
*College of Pharmacy*  
*Al-Azhar University-Gaza*

*Al-Azhar University-Gaza*  
*2010*

**ABSTRACT**

Coeliac disease is an important clinical disorder affecting the human gastrointestinal tract leading to multiple signs and symptoms in different body organs. This disease was the subject of a cross sectional descriptive-analytic study conducted in Ard El-Insan Palestinian Benevolent Association in the Gaza Strip during 2009. Study objectives were oriented to identify and verify several variables and attributes affecting the prognosis of coeliac patients including; socio-demographic factors, knowledge, attitude and compliance as well as testing the blood levels of calcium, albumin and body mass index. The study population included two groups of already diagnosed 95 children (34 males and 61 females) out of 113 patients. The studied children were distributed into two age groups from 2 to 11 years (66 patients) and from 12 to 18 years old (29 patients).

**Results** of this study showed that the mean age of patients was 5.47 years for males and 8.93 years for females. Results emphasized the inevitable annoying fact of coeliac disease presence in the Gaza Strip which is surprisingly not concerning the health professionals.

School children among patients constituted 66.3% against 33.7% below the school age.

The lifestyle of coeliac disease patients was proved to be directly proportional with better nutritional indicators. Poor social activity and inability to recognize the emblem illustrating gluten in foods reflected poor health awareness or promotion. The study showed that the more knowledgeable patients or mothers ( $P = 0.036$ ) the more compliant they were and likewise their BMI being normal ( $P = 0.049$ ). Most of patients in the two age groups were unable to get gluten free diet from any source in the Gaza Strip except AEI. A significant statistical relationship existed regarding the compliance towards giving gluten free foods outside home ( $P=0.037$ ) or the cautious

steps followed when buying foods or detergents ( $P=0.011$ ). According to BMI 74.4%, 23.4% and 3.2% of all patients were normal, underweight and overweight respectively. Albumin blood level was normal in 32.6% and low in 67.4%. Meanwhile, blood calcium level was normal in 76.8%, low in 21.1% and high in 2.1% of all patients.

**Conclusion:** The study showed that recreation and social activities for coeliac patients are substantially missing in the Gaza Strip. Moreover, the study proved that AEI is a reliable centre for care of coeliac disease patients and conducting relevant studies.

**Recommendation:** There is a need for thorough and continuous community and institutional mobilization regarding coeliac disease in the Gaza Strip and in Palestine.

## **Conclusion and Recommendations**

### **Conclusion**

This cross sectional analytic study was conducted in Ard El Insan Palestinian Benevolent Association over the period from June, throughout September 2009.

Results obtained were thoroughly analyzed and discussed in the former sections in order to obtain the most accurate and rational findings. An overall conclusion could be summarized in the following topics:

1. Coeliac disease is an existing fact in the Gaza Strip which requires further attention by health providers.
2. AEI is the organization in GS which support coeliac patients (Ard El-Insan, 2008).
3. Coeliac disease is predominant among females.
4. School age children were more amongst the total number of patients thus reflecting earlier detection of the disease than in adults or during adulthood.
5. The study showed a questionable statistical significance between the blood calcium level of coeliac patients and several socio-demographic variables.
6. High percentage of patients and mothers has contradicting ideas and notions regarding the life quality of patients with coeliac disease.
7. Most of patients lack the knowledge about emblem of gluten free food. This reflects inadequate health education services during counseling in AEI.
8. Contamination of food with gluten from different sources or food procedures inside and outside homes was poorly recognized by the patients and their care givers.
9. Unified knowledge pattern regarding coeliac disease is a matter of concern in many aspects relating to morbidity and mortality components.
10. Negative attitude and sense of stigmatism was not as high as expected and this refers to the fact that people were oriented to the coeliac disease as a submitted fact which might be tolerated.
11. Feeling stigmatized by patients or their mothers was translated into embarrassment when giving their children gluten free diet in front of others outdoors or in doors.

12. The majority of patients and families showed a high level of compliance towards gluten free food and medicines or detergents.
13. Males presented with lower blood calcium level than females.
14. BMI, Albumin and calcium blood levels were important indicators in determining the progress of coeliac disease.
15. Other clinical signs and symptoms of coeliac disease are important factors to judge upon the reliability of answer.
16. Ard El-Insan is the only specialized center dealing with coeliac disease.

### **Recommendation**

The following recommendations were considered by the researches as an outcome of this study.

- 1- More care in coeliac disease is recommended to be practiced in the primary, secondary and tertiary health care services by all health providing sectors.
- 2- Further investigations, researches and studies are necessary to facilitate building up policies for early case detection and management of coeliac disease in the Gaza Strip.
- 3- Health staff in all sectors should be encouraged, prepared and promoted in order to
- 4- contribute effectively to the process of management of coeliac disease.
- 5- Encouragement of social activities and community participation of coeliac patients
- 6- and their families are requested.
- 7- Development of programs in AEI and other healthy organization to support patients
- 8- psychologically.
- 9- More awareness at community and institutional levels about coeliac disease.
- 10- MOH and other health sectors should be ready to offer diagnostic facilities.
- 11- More health awareness and counseling on recommended gluten free diet.
- 12- More investigation of albumin blood level in coeliac patients and follow up are required.
- 13- Screening of risk individuals.