

Physical Activity and Hemoglobin Level Among Married Women During Childbearing Age in Mosul

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Abstract

Women's health in general is affected by various important social, cultural, behavioral, and biological factors. Physical activity of women through various domestic and occupational works differs according to their age, education, pregnancy status, and general health status. The effect of physical activity on hemoglobin level should not be ignored specially when considering women's health during childbearing age (15-49) whether pregnant or non-pregnant as the women more prone to iron deficiency anemia due to largely loss of blood with menstruation, pregnancy, physical effort, and insufficient dietary iron. The aim of this study is to determine the relation between physical activity and anemia state of married women during childbearing age. A cross sectional study design was adopted of 912 married women were seen at four randomly selected primary health care centers. These centers were (Al-Sukar, Al-Sharqi, Al-Hadbaa and Al-Mansoor), during the period from 1st August 2007 to 1st of February 2008. The interview was face-to-face, utilization the International Physical Activity Questionnaire the long version, 2002 to determine the level of physical activity. The information included in the data collection tool include, the socio-demographic character, levels of physical activity, and measuring of hemoglobin level. The study shows that half of non-pregnant were anemic and half of the pregnant were anemic too. The study revealed that two thirds of the women who were having heavy activities and 53.2% of the women with moderate activities were suffering from anemia according to Hb level. This study concluded that half of the sample was anemic and had association with physical effort, so that women in childbearing age need special care by increasing the attention towards providing better health care services in antenatal care center.

Key words: Anemia, physical activity

Introduction

Women performance as active or inactive females is accomplished through lifestyle activities (i.e., household, occupational, transportation, or leisure-time activities)(1). Physical activity of women through various domestic and occupational works differs according to their age, education, pregnancy status, and general health status(2). Regular daily physical activity promotes health, psychological well-being, and a healthy body weight (3). The Surgeon

General, in the United States 2001, has recommended that women of all ages will benefit better health when they conduct a moderate amount of physical activity, preferably daily. Excessive amounts of activity should be avoided, because risk of injury increases with greater amounts of activity(4).

In response to global demand an international Physical Activity Questionnaire (IPAQ) was developed for surveillance activities. The questionnaire is the most feasible instrument for measuring physical activity in large groups of

populations(5). The average daily physical activity according to the criteria of IPAQ form is (sedentary, mild, moderate, and heavy) physical activity(6).

Anemia remains a widest spread public health problem with major consequences for human health as well as social and economic development (7). Iron deficiency is the not only cause of anemia but where anemia is prevalent, iron deficiency is most commonly cause (8). The problem was found predominantly in developing regions (especially south Asia and sub-Saharan Africa) where 36% of the total population were estimated to be anemic compared to 8% in developed nations. Prevalence was particularly high in adult females (9). Women are more prone to iron deficiency anemia due to largely loss of blood with menstruation, pregnancy, physical effort, and insufficient dietary iron. The prevalence of iron deficiency anemia among highly active women is greater than among sedentary one, this generally results in decrease physical work capacity and performance (10). The aim of the study to determine the levels of the physical activities of women according to pregnancy status and to assess the specific aspect of the health status of women by estimating hemoglobin level.

Subjects and Methods

Prior to data collection, essential official permission were obtained from The Research Committee, Directorate General of Health in Ninawa. A formal consent were taken from every women include in the sample. A cross sectional study design was done at four randomly selected primary health centers (PHCCs) in Mosul. These centers were Al-Sukar PHCC, Al-Sharqi PHCC, A- Hadbaa PHCC, and Al-Mansoor PHCC, for six months duration extending from 1st August 2007 to 1st of February

2008. The cluster sampling was a feasible sampling method due to the lack of the sampling frame list(11). 912 married women were included in the sample from the total study setting.

Sample definition

Pregnants women who attended the specific health center seeking for antenatal care were included in the sample. Women in all trimesters of pregnancy were included in this study. Married women who were non-pregnant in the age of (15-49) years and attended the specific health center seeking medical care for their children or as a companion of patients were also taken in the present study. Unmarried women and married women who are outside this range of age were excluded from the study.

Data collection tool: The type of interview carried out in this study was face to face interview. Although this type of interview costs more time and effort, has certain interview bias, and lacks access response, it has certain advantages such as: personalization of the study to the participant and a better control over the questions(11).The variables in questionnaire form and methods used by the investigator were explained briefly with all women in the sample. The information included in the data collection tool include:

1- The age: The age of married women in the study sample was classified into four main groups and as follows: (15-24), (25-34), (35-44), and (45-49) years old.

2- Levels of physical activity: The average daily physical activity according to the criteria of IPAQ form is considered as follows:(6).

- 1- Sedentary physical activity: Includes time spent at work, at home, while doing course work, and during leisure time. This may include time spent in sitting at a desk, visiting friends, reading or sitting or lying down to watch television.
- 2- Mild physical activity: This is the lowest level of physical activity. It includes activities at work and at home, walking to travel from place to place, and any other walking that might be done solely for recreation, sport, exercise, or leisure for at least 10 minute.
- 3- Moderate physical activity: Moderate-intensity activities that achieving a minimum total physical activity of at least 600 MET minutes/week (MET= kcal/kg .h). The moderate physical activities make the women breath somewhat harder than normal and are done for at least 10 minutes at a time.
- 4- Heavy physical activity: Vigorous-intensity activity that achieving a minimum total physical activity of at least 1500 -3000 MET-minutes/week. Vigorous activities make the women breath much harder than normal and are done for at least 10 minutes at a time(6). IPAQ 2002, methods in ascertaining the level of activities were well documented in many studies with regard to their validity and reliability. The initial validation of long IPAQ formats showed good test-retest repeatability

(repeatability coefficient for the pooled data from all 14 study centers was 0.81) (12). Most of the available data on physical activity were for occupational activity, and domestic duties, with less direct data available on leisure time activity, and activity related to transport.

3-Hemoglobin measurements:

Hemoglobin measurement level was applicable on (912) pregnant and non pregnant women. Those who was inter view their venous blood sample was taken from upper arm with help of the technician using K3EDTA tube which was put it in cooler box and transfer in the same day in the afternoon to the laboratory of Ibn Sina Teaching Hospital,

WHO in 1992, recommended that, a result of 11 gm/dl and more was normal value for pregnant women. A result of 12 gm/dl and more was normal value for non-pregnant women(13).

Statistical analysis

The information regarding each women was transferred into a code sheet and data entry was done using computer Pentium IV. Statistical analysis was done using the SPSS package version [12]. Using chi-square (χ^2), with the P value at a level of significance equal to or less than 0.05 was considered. The data were presented in suitable tables and figures. Percentages were calculated for the various group variables

Results

Levels of physical activity and pregnancy status

The distribution of pregnant mothers according to their age and physical activity is shown in Table (1a). The table denotes that 31.3% of pregnant mothers were sedentary. While 45.5% of them were having activities of the moderate type, 14.2% of the heavy type and 9.0% of the mild type. Half of pregnant mothers were in the age of (15-24) years and 1.6% were in 45 years and above. Pregnant mothers in age (15-24) were sedentary in 75.3%. The percentage of pregnant mothers who had heavy activities in this age group were 40.0%.

The non-pregnant mothers are distributed according to their age and physical activity in Table (1b). It is revealed that 57.4% of the non-pregnant mothers were having moderate form of activities and 14.8% were sedentary. Mild activity were seen in 14.4% and heavy activities were noticed in 13.4%. The table also shows that 39% of the non-pregnant mothers who were sedentary were in the youngest age group. Heavy form of activities were seen in 39.1% of non-pregnant women of the age (35-44) year

Anemia status and levels of physical activity

Anemia among pregnant and non pregnant mothers (a sample of 912 women) is revealed in Table (2). It is revealed that 53.0% of the women whose hemoglobin

levels were assessed were having anemia. No significant difference was seen among pregnant and non-pregnant mothers in having anemia.

Physical activities of pregnant and non-pregnant women and presence of anemia are presented in Table (3). It is revealed that two thirds of the women who were having heavy activities and 53.2% of the women with moderate activities were suffering from anemia. It is seen also that 40.5% of women with mild activities and 53.4% of the sedentary women were having anemia.

Discussion

Sedentary level of physical activity was 75.3% among the youngest pregnant mothers. Most of the primgravid women are young. More care is advised to be provided for those women since primgravid is considered as risk group mothers. On the other hand many young pregnant mothers were found in the heavy level of activity and that could be due to the increased responsibilities according to type of occupational work, number of children, and social status of the mothers.

Assessment of physical activities during pregnancy was not widely investigated on population level. A study performed among pregnant women in Southern Brazil 2004, about leisure time physical activity which had not included work or home related activity, found that only 4.3% were active during pregnancy (14).

Anemia was detected in half of the women in the present sample in general by measuring hemoglobin level. There was no significant difference between pregnant and non pregnant in having anemia.

A study done in Baghdad city 1994, showed that half of the pregnant mothers in primary health care center were anemic (15). Anemia is a major health problem affecting an estimated 2 billion people and that approximately 50% of all anemia can be attributed to iron deficiency anemia (16). While a study that was conducted in Mosul city 1997, among pregnant women attending antenatal clinic in their 2nd and 3rd trimester the percentage of women with anemia was 59.0% (17).

A report of WHO in 2001, revealed that nearly half of the pregnant women in the world were estimated to be anemic in a range of 52.0% in the non industrialized as compared with 23.0% in industrialized-countries. In India 88.0% of pregnant and 75.0% of the non pregnant women were affected by anemia. In many African countries in 1990-1995, 50.0% of pregnant and 40.0% of the non pregnant were anemic respectively (18).

The present study revealed that two thirds of the women were having heavy activity and one half with moderate activity were having anemia.

A study done in California in 1983, among females in childbearing age engaged in moderate physical activity, revealed that a significant decline in hemoglobin

concentration was observed at 5 weeks interval (19).

A Symposium about exercise and iron status, indicated that iron deficiency anemia was a common problem in athletes who did not increase iron intake above that of general population. In several recent observations of iron deficiency anemia was associated even with mild exercise, mechanism of that activity enhance excretion of iron by interference of absorption in addition to that transfer of the iron to muscle fiber to compensate the need of oxygen during activity (20).

Conclusions

Half of the study sample were anemic, and half of the pregnant mothers were anemic too. Two thirds of the women who were having heavy activities and 53.2% of the women with moderate activities were suffering from anemia.

Recommendations:

- 1- Further more specific research to evaluate the anemia state among pregnant and non-pregnant mothers.
- 2- Improvement of the quality and quantity of the antenatal care services for better improvement of women health.

References

- 1- Centers for Disease Control and Prevention (CDC). U.S. Physical Activity Statistics: Definitions. Atlanta: CDC; 2006:1-2.
- 2- Trost SG. Factor influencing physical activity behavior in youth. In: Trost SG (ed). Discussion paper for the development

of recommendations for children's and youths' participation in health promoting physical activity. 2nd edition Australia: University of Queensland; 2005:55-59.

3- Health Resources and Services Administration (HRSA). A Report: Women's Health USA 2005. Rockville, Maryland: U.S. Department of Health and Human Services (DHHS); 2005:25-30.

4- U.S. Department of Health and Human Services (DHHS). Physical activity and health. Women. A Report of the Surgeon General. Atlanta: CDC; 2001:1-2.

- Rütten A, Ziemainz H, Schena F, Stahl T, Stiggelbout M, Auweele YV, Vuillemin A, Welshman J. Using different physical activity measurement in eight European countries. *Public Health Nutr* 2002a; 6(4): 371-376.

6- International Physical Activity Questionnaire (IPAQ). Guidelines for Data Processing and Analysis of the International Physical Activity Questionnaire (IPAQ). USA: IPAQ; 2005:1-15.

7- Bagch K. Iron deficiency anemia-an old enemy. *East Mediter Health J* 2004;10 (6):754-760.

8- Zuberbühler A. The Health of Pregnant women in rural Tanzania with specific emphasis on anemia and the impact of socially marketed insecticide treated bednets. A Dissertation. Basel University: Switzerland; 2002:1-10.

9- Stoltzfus RJ, Dreyfuss ML. Guidelines for The Use of Iron Supplements to Prevent

and Treat Iron Deficiency Anemia.

Washington: International Life Science Institute (ILSI) Press; 2007:1-5.

10- Blum SM, Sherman Ar, Boileau RA. The effect of fitness-type exercise on iron status in adult women. *Am J Clin Nutr* 1986;43:456-463.

11- Neutens JJ, Rubinson L. Research Technique for the Health Science. 3rd edition. San Francisco: Benjamin Cummings; 2002:139-150.

12- Mikael F, Jarmo M, Jaana S, Matti S, Heikki K, Matti M, et al. International Physical Activity Questionnaire: Validity against fitness. *Med Sci Sports Exerc* 2006;38(4):753-760.

13- World Health Organization (WHO). The prevalence of anemia in women. A tabulation of available information. Geneva, Switzerland: WHO; 1992:6.

14- Domingues MR, Barros AJD. Leisure-time physical activity during pregnancy in the 2004 Pelotas birth cohort study. *Rev Saúde Pública* 2007;41(2):173-80.

15- Dawood AN. Anemia and nutritional status of pregnant women attending M.C.H. center in Baghdad city. A Dissertation in Community Medicine. Iraq: Fellowship of the Iraqi commission for Medical Specializations in Community Medicine; 1994:37-38.

16- Benoist B. Focusing on anemia. Towards an integrated approach for effective anemia control. Geneva, Switzerland: World Health Organization

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(WHO)/ United Nation Children's Fund (UNICEF); 2004:1-2.

17- Al-Azzawi NAM. Evaluation of using iron/folate tablets in treating anemia among pregnant women. Diploma A Dissertation in Community Medicine. Mosul University. Mosul Medical Collage, Community Medicine Department. Iraq; 1997:24.

18- World Health Organization (WHO). Iron deficiency anemia Assessment,

Prevention and Control. A Guide for Programme Managers. Geneva, Switzerland: WHO; 2001:15-16.

19- Hegenauer J, Strause L, Saltman P, Dann D, White J, Green,R. Transitory hematologic effects of moderate exercise are not influenced by iron supplementation. Eur J Appl Physiol 2006; 52(1): 1-2.

20- Weaver CM, Rajaram S. Exercise and iron status. Symposium: nutrition and exercise. J Nutr 1992;11:782-787.

Table (1a): Distribution of (205) pregnant women (%) according to their age and levels of physical activities

Age groups in years	Levels of physical activity					
	Sedentary	Mild	Moderate	Heavy	Total	
	%	%	%	%	No.	%
15 – 24	75.3	50.0	32.1	40.0	100	48.8
25 – 34	22.1	22.7	48.2	28.6	71	34.6
35 – 44	2.6	27.3	17.9	25.7	30	14.6
45 -49	0.0	0.0	1.8	5.7	4	2.0
Total (%)	64 (31.3)	19 (9.0)	93 (45.5)	29 (14.2)	205	100.0

Table (1b): Distribution of (707) non-pregnant women (%) according to their age and levels of physical activity

Age groups in years	Levels of physical activity					
	Sedentary	Mild	Moderate	Heavy	Total	
	%	%	%	%	No.	%
15 – 24	39.0	15.3	10.6	6.3	106	15.0
25 – 34	31.2	27.7	30.7	28.1	213	30.0
35 – 44	18.4	40.9	38.3	39.1	252	36.0
45 -49	11.4	16.1	20.4	26.5	136	19.0
Total (%)	105 (14.8)	101 (14.4)	406 (57.4)	95 (13.4)	707	100.0

Table (2): Presence of anemia among pregnant and non-pregnant women (sample size= 912)

Anemia	Pregnant		Non-pregnant		Total		p* value
	No.	%	No.	%	No.	%	
Present	116	12.8	367	40.2	483	53.0	0.238
Absent	89	9.8	340	37.2	429	47.0	
Total	205	22.5	707	77.5	912	100.0
* Using X^2							

Table (3): Percentage distribution of pregnant and non- pregnant women according to their levels of physical activity and anemia (sample size = 912)

Anemia Status	Levels of physical activity					
	Sedentary	Mild	Moderate	Heavy	Total	
	%	%	%	%	No.	%
Present	53.4	40.5	53.2	62.6	483	53.0
Absent	46.6	59.5	46.8	37.4	429	47.0
Total no.	146	121	511	134	912	100.0
(%)	16.0	13.3	56.0	14.7		