

Assessment of the Effect of Applying WHO-UNICEF Guidelines for Control of Anemia during Pregnancy at Hodeida City (Yemen) During the Year 2021

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ABSTRACT

Background and Objectives: Iron deficiency anemia, is common in pregnant women. The global prevalence of anemia in pregnancy (AIP) is estimated as 41.8% and in more than 80% of countries in the world, the prevalence of AIP estimated at 29%. AIP is associated with increased maternal, neonatal and perinatal mortality, low birth weight, premature birth, and delayed child development. This study aimed to assess the effect of applying WHO-UNICEF guidelines for AIP control at Hodeida city, Yemen.

Methods: Facility based interventional prospective study had conducted in 17 health centers of Hodeida city which had randomly distributed to 8 experimental and 9 control health centers, selecting 250 pregnant women from experimental health centers and equal number from control ones. Experimental health centers had intervened through training on, and managing pregnant women for anemia according WHO-UNICEF guidelines while pregnant women at control health centers had managed according health centers own approaches. Pregnant women at both types' health centers had followed 3 times till labor for Hb response, pregnancy and labor courses and complications. Data statistically analyzed using SPSS program (Version 22) including descriptive statistics, t test for examining the difference in means of Hb response, pregnancy and labor complications among the experimental and control groups

Results: The study revealed statistically significant 20% higher Hb improvement rate in experimental group compared with control group on applying WHO – UNICEF guidelines for AIP control at primary health centers ($P = 0.00$, $t = 4.27$). Also, statistically significant decrease of pregnancy complications ($P = 0.02$, $t = -2.445$) and labor complications ($P = 0.001$, $t = -3.472$) had been reached on applying the protocol.

Conclusion: Applying WHO – UNICEF guidelines for AIP control at primary health centers improved Hb response and decreased antenatal and natal complications.

Key Words: Anemia, Pregnancy, Guidelines, Assessment

INTRODUCTION

WHO has divided middle east region into overlapping country clusters regarding nutrition stages and dominant nutrition problems, considering Djibouti, Iraq, Pakistan, and Yemen as countries with

significant under nutrition having a high prevalence of malnutrition ⁽¹⁾. Current armed conflict in Yemen had significant negative effects on public health system, limiting access to and the quality of preventive and curative health services ⁽²⁾.

1.1 million Pregnant and lactating women in Yemen became acutely malnourished ⁽³⁾.

Females are consistently at greater risk of anemia across almost all geographic regions and in most age groups ⁽⁴⁾.

Iron deficiency, with or without anemia, is common in pregnant women and, the global prevalence of anemia in pregnancy (AIP) is estimated to be approximately 41.8%, and in more than 80% of countries in the world, the prevalence of AIP estimated at 29% ⁽⁵⁾. In most low and middle income countries (LMICs), anemia is a major cause of maternal and child mortality and is associated with an increased risk of low birth weight, cognitive impairment, increased susceptibility to infection, and delayed physical and mental development ⁽⁵⁾. In Yemen, prevalence of AIP is 40% ⁽⁶⁾.

Most cost-effective programs for the prevention of anemia among women include food fortification of iron, iron supplementation and community-based health promotion ⁽⁷⁾

Since 1989 while WHO had produced guidelines on preventing and controlling iron deficiency anemia through primary health care, which demonstrated anemia as a global public health problem and emphasized on high significance of applying WHO/UNICEF joint Nutrition Support Programme (JNSP) for improving the nutritional status of mothers and children through primary health care and after coming efforts; global fighting to manage this big problem continued through updating strategies and recommendations for anemia prevention and control ⁽⁸⁾.

WHO and UNICEF, in early 1993, circulated a "Protocol for Prevention of Anemia in Pregnancy". Initially 30 countries in the five regions of WHO were contacted by sending the protocol document to national government. In the Eastern Mediterranean Region, the protocol was sent to all countries, and as of March 1995 eight countries have carried out the first phase of the protocol ⁽⁹⁾.

WHO and UNICEF Protocol for Prevention of AIP stated that; Health providers, attending women during antenatal and postpartum visits must (1- Give all pregnant women a standard dose of 60 mg iron + 400 µg folic acid daily for 6 months or, if 6 months of treatment cannot be achieved during the pregnancy, either continue supplementation during the postpartum period or increase the dosage to 120 mg iron during pregnancy. 2-Where the prevalence of anemia in pregnancy is over 40%, advice the woman to continue the prophylaxis for three months in the postpartum period. 3- Give iron supplementation even if folic acid is not available. 4-Examine or screen all women for anemia during antenatal and postpartum visits. 5-Treat anemia with doses of 120 mg iron daily for three months. 6-Follow up after two weeks to check clinical progress, test results and compliance and again four weeks later all women with severe anemia that have been treated with iron and folate. 7-Refer women with severe anemia to a higher level of care if they are in the last month of pregnancy, have signs of respiratory distress or cardiac abnormalities such as edema, or when the conditions do not improve or worsen after one week of iron/folate therapy. 8-Provide advice on the consumption of iron-rich foods and vitamin C. 9-Record test results and the treatment provided in the woman's card ⁽¹⁰⁾.

Countries with higher levels of anemia prevalence (20% or higher) are more likely to have a favorable policy environment (including policy goals and coordination mechanisms) to support anemia-reduction programmes. It is therefore urgent that countries review national policies, infrastructure and resources and act to implement strategies for the prevention and control of anemia ⁽¹¹⁾. The WHO Global Nutrition Target 2025 on anemia aims to reduce anemia in women of reproductive age (WRA) by 50% by 2025 ⁽¹²⁾.

In Yemen, no enough attention paid to manage AIP problem on the national

level, in addition, there is scarcity of health researches to help decision makers to overcome this big national problem. Scope of this study is to assess the impact of WHO-UNICEF protocol of AIP control.

MATERIALS AND METHODS

Study setting:

Study had been conducted in 17 maternal and child (MCH) health centers at Hodeida city. These MCH centers are providing antenatal, natal and post natal care, family planning services, child and mother vaccination, child growth monitoring, oral rehydration therapy and some are providing supplementary feeding programs for malnourished pregnant women and children. Management of anemia during pregnancy at these MCH centers is provided among antenatal care service.

Study design

Facility based interventional prospective study was conducted at Antenatal care (ANC) clinics of mentioned 17 MCH centers at Hodeida city, Yemen, during the period (mid-November 2020-mid August 2021

Sample size determination

Sample size had been calculated using on line computerized soft program (13) estimating number of pregnant women is 27104 (according population projections for the year 2020) and assuming the prevalence of AIP in Hodeida city is going with Yemeni national figure as 40% (6). The total calculated representative sample with 5% error yielded was 379. The sample size was increased to 500 to improve the precision of the study.

Sampling methods

Health centers were selected upon client attendance rate thus, all high and average attendance rated MCH health centers in Hodeida city were selected and they reached 17 health centers out of 26 health centers representing all Hodeida city health centers. Study health centers (HCs)

had randomly distributed to 8 experimental and 9 control health centers. 250 pregnant women were selected from experimental HCs and equal number had selected from control HCs according criteria mentioned above and considering attendance rate while allocating quota of the health center in study sample by the ratio 3 cases from high attendance MCH against 2 cases from mid attendance MCH centers.

The study sample was first and second-trimesters pregnant women attending ANC who haven't had any of exclusion criteria

(Hereditary blood diseases, aplastic anemia or leukemia, bleeding during pregnancy, GIT bleeding or Hepatic, renal, or heart diseases)

The study sample has revealed in the table 1.

Table 1: Study sample per HF, type of intervention

Type of intervention	Name of health facility	cases	
		No.	%
Experimental MCH centers	Al-Hali HC	26	5.2%
	Al-Senaeei HC	34	6.8%
	Palestine HC	32	6.4%
	Al-Hawk HC	31	6.2%
	Al-Shahariah HC	33	6.6%
	Al- Rabassah HC	33	6.6%
	Al-Zabariah HC	35	7%
	Al-Bostan HC	26	5.2%
Total experimental cases		250	50%
Control MCH centers	Al-Zaafran HC	30	6%
	Al Salakhanah MCH center	44	8.8%
	Al-Kedf HC	20	4%
	Al-Baida Al-gharbiah HC	17	3.4%
	Al-Thawrah MCH center	45	9%
	Al-Qasr HC	20	4%
	Al-Tahrir HC	37	7.4%
	Al-Ommal HC	25	5%
	Al-Qalaa HC	12	2.4%
Total control cases		250	50%
Grand total study cases		500	100%

Conducting intervention and data collection

The intervention which had been conducted in experimental health centers had included training of midwives on, and managing cases of anemia during pregnancy according WHO-UNICEF guidelines and emphasis on mothers' education regarding locally available foods which are rich of iron and vitamin C, while pregnant women

at control health centers had managed according health centers own approaches. Pregnant women at health centers of both interventional types had followed 3 times till labor for Hb response, pregnancy and labor courses and complications through filling these data by midwives in a previously - prepared data tools and their matching on receive with data in official ANC records at MCH, Hb had been tested at the end each of the three visits at the same MCH laboratory by hemoglobinometer.

Data Entry and Analysis

SPSS (version 22) had used for data entry and analysis. The data were analyzed using descriptive statistics including frequencies, percentages, means and standard deviation.

Independent t test had been used for examining the difference in means of Hb therapeutic response, pregnancy and labor complications among the two groups of study namely (experiments and control)

Where: t-distribution with $v = (T1+ T2 - 2)$ degree of freedom. T_i and T_j are the size means of the sample i ($i = 1, 2$), respectively.

RESULTS

Study revealed the effects of applying WHO/UNICEF protocol of AIP control which has shown in tables 2-4) were:

- Applying WHO/UNICEF protocol of AIP control improved Hb response in 61% of experimental group members opposite 41% in control group members ($P = 0.00$, $t = 4.27$)
- Applying WHO/UNICEF protocol of AIP control decreased pregnancy complications in experimental group to 1% compared to 5% in control group ($P = 0.02$, $t = -2.445$)
- Applying WHO/UNICEF protocol of AIP control decreased labor complications in experimental group to 2.2% compared to 8.9% in control group ($P = 0.001$, $t = -3.472$)

Table 2: Distribution of study sample per type of intervention and Hb response

Type of intervention		Hb response							Total	
		Missing		Worsening		Same		Improving		
		No	%	No	%	No	%	No		%
	Experimental	18	49	21.0%	41	18%	142	61%	232	
	Control	14	107	45%	33	14%	96	41%	236	
Total		32	156		74		238		468	

Table 3: Distribution of study sample per type of intervention and occurring pregnancy complications

		Occurring pregnancy complications				Ratio of positive cases
		Missing	Negative	Positive	Total	
Type of intervention	Experimental	18	230	2	232	0.09%
	Control	14	224	12	236	5%
Total		32	454	14	468	
Type	N	Mean	SD	t	P value	
	Experimental	250	.95	.349	-2.445-	0.02
	Control	250	1.05	.575	-2.445-	

Table 4: distribution of study sample per type of intervention and occurring labor complications

		Occurring labor complications				Ratio of positive cases
		Missing	Negative	Positive	Total	
Type of intervention	Experimental	18	227	5	232	2.2%
	Control	14	215	21	236	8.9%
Total		32	442	26	468	
Type	N	Mean	SD	t	P value	
	Experimental	250	.95	.349	-3.472-	0.001
	Control	250	1.05	.575	-3.472-	

DISCUSSION

Woman must enter pregnancy with iron stores of ≥ 300 mg if she is to meet her requirements fully. Results of controlled

studies indicated that the deficit can be met by iron supplementation, but inadequacies in health care delivery systems have limited

the effectiveness of larger-scale interventions ⁽¹⁴⁾.

The most recent WHO recommendations on iron supplementation during pregnancy are part of the new anti natal care (ANC) guidelines which recommend daily oral iron and folic acid supplementation to prevent maternal anemia ⁽¹⁵⁾. The recommended daily dose of elemental iron for patients with iron deficiency anemia ranges from 120 mg to 200 mg, the second important issue is administration of this element to patients with iron deficiency anemia for a longer period of time ⁽⁴⁾.

Although, Yemen is considered as having sever AIP public health problem ⁽¹⁶⁾, the present study revealed, there is still struggle to incorporate its true management among MCH services package.

The present study intervened through training on WHO-UNICEF protocol for AIP control, ensuring availability of logistic supplies, training midwives on AIP and its management, nutritional educating of pregnant women regarding anemia and activating referral system of difficult AIP cases to the hospitals.

The impact was improving Hb response in 61% of experimental group opposite 41% in control group, which is attributed in part to the effect of regular supplementation of iron and folic acid, this is supported by many studies such as , a study conducted in Pakistan ⁽¹⁷⁾, and more recent study conducted in India ⁽¹⁸⁾. On other part, the higher Hb improvement rate in experimental group members could be attributed to the emphasis on counseling and health education of mothers regarding AIP and locally available foods which are rich in iron and vitamin C.

Health education evidence in improving Hb response in AIP management had been supported by many studies such study conducted in Indonesia ⁽¹⁹⁾ and other study conducted in India ⁽²⁰⁾.

Impact of Applying the protocol included decreased pregnancy complications to 1% in experimental group

compared to 5% in control group which had been understood due the better managing AIP among the experimental group led to better avoidance of AIP sequences on pregnancy as supported by many studies such study conducted in Thailand ⁽²¹⁾, and USA ⁽²²⁾.

Impact of Applying the protocol also included decreased labor complications to 2.2% in experimental group compared to 8.9% in control group Which had been understood due the better managing AIP, among the experimental group led to better avoidance of AIP sequences during labor which had approved by many studies such conducted in Palestine ⁽²³⁾ and Pakistan ⁽²⁴⁾.

CONCLUSION

The study found statistically significant 20% higher Hb improvement rate in experimental group compared with control group on Applying WHO – UNICEF protocol for AIP control at health centers. Also, significant decrease of pregnancy and labor complications had been reached on applying the protocol.

Acknowledgment

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Ethical Approval

The proposal for this research was approved by community and family medicine department in Faculty of medicine at Gezira University, Sudan, as a part of proposal for PHD degree. Research had approved by research ethics committee at Yemen University

Conflict of Interest

The authors report no conflict of interest regarding this report.

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