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Anemia in Pregnant Women in Kirkuk Governorate

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Abstract: Anaemia is defined as hemoglobin levels of ≤ 11 g/dl , is one of the world's leading causes of disability , and thus one of the most serious global public health problems More than 50% of the pregnant women in the world are anemic. Knowledge about the anemia is very important in our community. This knowledge will encourage those who work in primary health care provider for pregnant women to detect the problem earlier and treat the problem properly. To determine the problems related to anemia in pregnant women in Kirkuk governorate. A total of 250 pregnant women were asked while attending antenatal unit in Azadi Teaching Hospital and several Primary Health Centers in Kirkuk City between November 25, 2014 and March 1, 2015. Data taken were age, residency, educational level, history of last menstrual period, onset of anemia and concentration of hemoglobin (Hb) were obtained and analyzed. From the total (250) pregnant women (61.6%) of them have low Hemoglobin (Hb) level either mild, moderate or severe anemia the majority of them (75.33%) with mild anemia. according to severity there is just (3.2%) of total cases have severe anemia. This study shows that the prevalence of anemia among Kirkuk city women during pregnancy is (61.6%) in comparing to (52%) in the world wide in developing countries.
Keywords: Anemia, haemoglobin level, pregnancy, Iraq, Kirkuk city.

INTRODUCTION

"Iron deficiency anemia (IDA) is the most common nutritional deficiency in the world; estimates suggest that 2 billion persons worldwide are iron deficient" [1]. As aresult of the increased iron reqirmemt during pregnancy for mother and growth baby are recognized os it will be most susceptible groups to IDA.

IDA during pregnancy has good relation on mother health and growth of baby [2]. IDA during pregnancy is associated with higher rates of premature labour and low birth weight [3, 4] Severe anemia during pregnancy increases the risk of reproduction-related mortality and mobidity at delivery and during the perinatal period [5]. IDA in infants may also impaire cognitive development [6, 7] and may have long-term consequences. Severe IDA in infants has been associated with delayed psychomotor development and developmental delays >10 y after the treatment of iron deficiency during infancy [8]. The total amount of iron requirements during pregnancy in a 55-kg women are ≈1040 mg [9]. Most of this iron is required during the last trimester, at which time daily iron needs increase from before pregnancy requirements of ≈1–1.5 mg/d to ≤6 mg/d [5, 9]. The amonts of the requirement is difficult to supplied from dietary sources alone, especially in developing like our country where the foods are often low in iron content and bioavailability is generally low or moderate because of high intakes of dietary fiber and phytates".

"Anemia in pregnancy is defined by the World Health Organization (WHO) as a hemoglobin concentration less 11 g/dl" [10]. It continues to be a major health problem in many developing countries and is associated with increased rates of maternal and perinatal mortality, morbdity, premature delivery, low birth weight, and other adverse outcomes [11, 12]. More than half of the pregnant female in the world have low hemoglobin level [10]. Although only 15% of pregnant female are anemic in developed countries [13], the prevalence of anemia in pregnant female in developing countries is relatively high (33% to 75%) [10, 12, 14, 16]. The most common cause of anemia in pregnancy worldwide is IDA [12]. The most important predisposing factors for IDA include grandmultiparity, poverty, and impropre child spacing – among others" [17, 20].

Pathophysiology

"The maternal blood volume in the last trimester is about 30 % more than nonpregnant. This increase amount occurs mainly during the second and third trimester of pregnancy. The reason behind this increased blood volume is likely due to increase

hormone like aldosterone and estrogens, which are greatly increased in pregnancy, and to increased volume of fluid reabsorption by the kidney. Also, the bone marrow will produces more red blood cells and become active during pregnancy and with the excess fluid volume retention blood volume will increase [21]. Also during pregnancy, hemoglobin concentration drops because the plasma volume expansion is relatively greater than the red cell mass increases. There are many causes of anemia during pregnancy but most commonly due to decrease hemoglobin production because of reduce amount of important precursors such as iron and folate. Less extent the causes of anemia during pregnancy, it may be due to hemolytic proses or chronic blood loss" [22].

"Types of Anemia during Pregnancy: Several types of anemia can develop during pregnancy, these include:

Iron-deficiency anemia (IDA):

"This type of anemia develops when iron losses or physiological requirements exceed absorption. In women of child-bearing age, menstrual blood loss, pregnancy and breastfeeding contribute to iron deficiency by depleting iron stores; in developed countries one-third of pre-menopausal women have low iron stores but only 3% display iron-deficient haematopoiesis.IDA is the most common cause of anemia in pregnancy" [25, 29].

Folate-deficiency anemia:

"Folate, also called folic acid. The human requires folic acid to produce new cells, including blood cells. During pregnancy, female requires more Folate. But sometimes the dietary intake doesn't meet the body requirement of folic acid. When that occurs, the end result is cells with arrested nuclear maturation but normal cytoplasmic development: so-called nucleocytoplasmic asynchrony. All proliferating cells will exhibit megaloblastosis; hence changes are evident in the buccal mucosa, tongue, small intestine, cervix, vagina and uterus. The high proliferation rate of bone marrow results in striking changes in the haematopoietic system in megaloblastic anaemia.folic acid deficiency can be responsible to special kind of congenital anomalies, such as neural tube defects (spina bifida) and intrauterine growt h retardation" [25, 29].

Vitamin B12 deficiency

"The average daily diet contains 5-30 µg of vitamin B12, mainly in meat, fish, eggs and milk-well in excess of the 1 µg daily requirement. When a pregnant female doesn't eat enough vitamin B12 from her diet, her body can't produce enough healthy amount of RBC" [25, 29].

"The last two types are regarded as Megaloblastic anemia which is a type of anemia characterized by the presence of special morphologic appearances and characteristics of the developing RBC in the bone marrow. The marrow is usually cellular with megaloblastiod maturation and the anemia is due to ineffective erythropoiesis" [23].

PATIENTS & METHODS

The present Research was include 250 pregnant women attending ante-natal care units in Azadi teaching hospital & several PHCs in Kirkuk city between the periods November 1. 2014 and March 25. 2015.

Data on questionnaire that were taken were age , residency , educational level , history of last menstrual period , onset of anemia was at which trimester , severity of anemia , any medications & blood transfusion taken during pregnancy, any associated diseases and previous history of anemia were obtained either by direct asking patients during their visit or by records kept by hospital & PHCs.

Concentration of hemoglobin (gm/dl) was obtained from case sheets & patient report files at Azadi teaching hospital & PHCs. A hemoglobin value of less than 11.0 g/dL was considered to be anemia in pregnancy. The degrees of anemia studied were mild anemia (9.0–10.9 g/dL), moderate anemia (7.0–8.9 g/dL), and severe anemia (less than 7.0 g/dL).

Data were documented in master sheet by Microsoft excel program & analyzed based upon variables into tables and charts like relationship of degree of anemia & age, residence, ANC, educational level, trimester which anemia began & multiple pregnancy.

RESULTS

Table-1: Number and percentage of deferent cases

CASES	Number	Percentage
Total cases	250	
Total anemic cases	154	61.6 %
Cases with mild anemia	116	75.33
Cases with moderate anemia	30	19.48
Cases with severe anemia	8	5.19
Total normal cases	96	38.4%

From the total (250) pregnant women (61.6%) of them have low Hemoglobin (Hb) level either mild, moderate or severe anemia the majority of them (75.33%) with mild anemia. according to severity there

is just (3.2%) of total cases have severe anemia. While the reminder (38.4%) have normal Hb level.

Table-2: Shows the degree of anemia among pregnancy in relation to their age (years)

Age(year)	Mild		Moderate		Severe		Normal		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
A=(15-24)	56	56.0	8	8.0	5	5.0	31	31.0	100	40
B=(25-34)	51	39.85	20	15.63	2	1.56	55	42.96	128	51.2
C=(>34)	9	40.91	2	9.1	1	4.54	10	45.45	22	8.8
Total	116		30		8		96		250	

X^2=10.77 DF=12 P.value=0.548726

The most cases that was reported in this study is between (25-34 years old) that is about (51%) of total cases, and who is (15-24 years old) is (40 %) of total cases.

About (69%) of who are between (15-24 years old) have anemia with (56%) of them mild. While about (57%) of the women who are between age (25-34 years) having Hb level below normal value. in other hand the older age (>34 year) about (54.5%) of them is anemic.

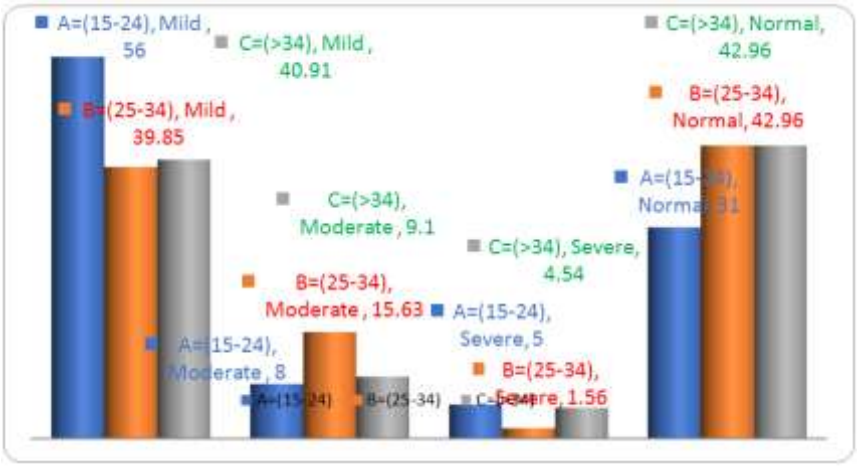

Fig-1: Shows the degree of anemia among pregnancy in relation to their age (years) in percentage

Table-3: Shows the relationship between the degree of anemia and the trimester at which the anemia started

Trimester at which anemia begins	Mild		Moderate		Severe		Total
	No.	%	No.	%	No.	%	
First	29	82.85	6	17.15	0	0.0	35
Second	49	79.04	10	16.13	3	4.83	62
Third	38	66.67	14	24.56	5	8.77	57
Total	116		30		8		154

X^2= 5.398 DF= 4 P value= 0.248842

Among the (61.6%) of the anemic pregnant women most of the cases (40.2%) was started at second trimester, and (37%) started at third trimester, while the other (22.7%) at first trimester.

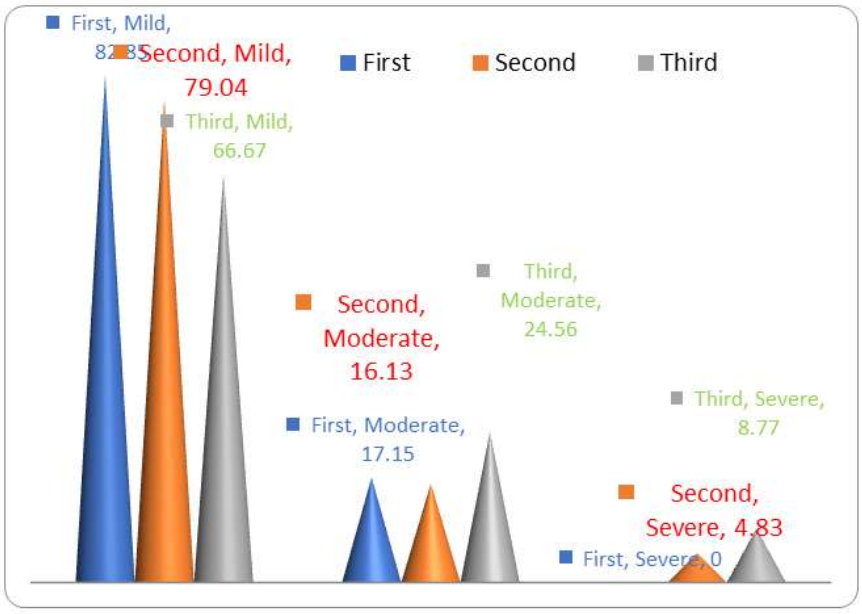

Fig-2: Shows the relationship between the degree of anemia and the trimester at which the anemia started

Table-4: Shows the relationship between the degree of anemia and the ante natal care of the pregnant women

ANC	Mild		Moderate		Severe		Normal		Total
	No.	%	No.	%	No.	%	No.	%	
Regular	53	53.53	14	14.15	7	7.07	25	25.25	99
Irregular	63	41.72	16	10.59	1	0.67	71	47.02	151
Total	116		30		8		96		250

X^2=17.43 DF=3 P.value=0.000576

Unfortunately more than the half of pregnant women about (60.4%) not went to the ante natal care ANC and (53%) of them have Hb level below the normal (41.7%) of them is mild.

While (39.6%) of the pregnant women was went to ANC regularly and (53.5%) of them mildly anemic.

Table-5: Shows the degree of anemia among pregnancy according to their Residence in number and percentage

Residence	Mild		Moderate		Severe		Normal		Total
	No.	%	No.	%	No.	%	No.	%	
Urban	113	47.48	29	12.18	8	3.36	88	36.98	238
rural	3	25	1	8.34	0	0.0	8	66.66	12
Total	116		30		8		96		250

X^2=4.407 DF=3 p value = 0.220737

From the study of residence of the women who reported about (95.2%) of them live inside Kirkuk city (urban) and about (63%) of them have low Hb level.

In the other side the reminder (4.8%) of pregnant women who reported live outside the city (rural) and about (66.6%) of them have normal Hb level.

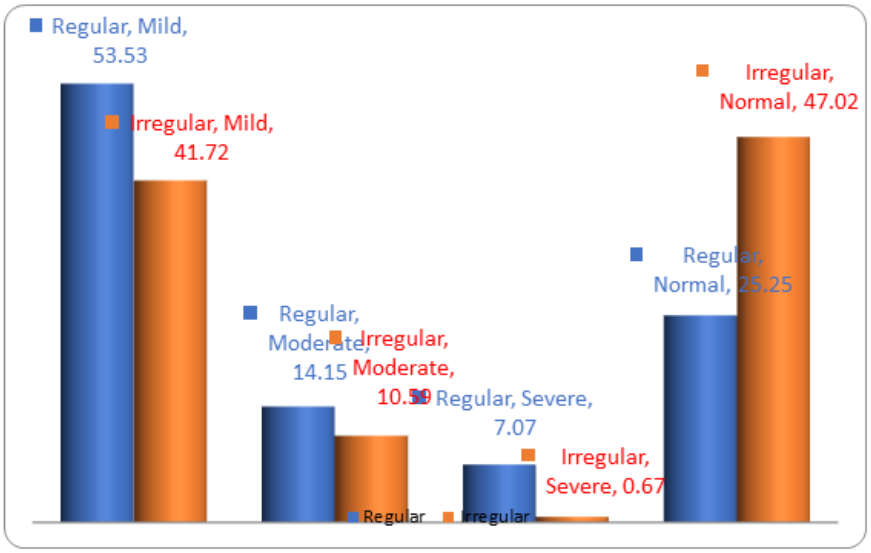

Fig-3: Shows the relationship between the degree of anemia and the ante natal care of the pregnant women

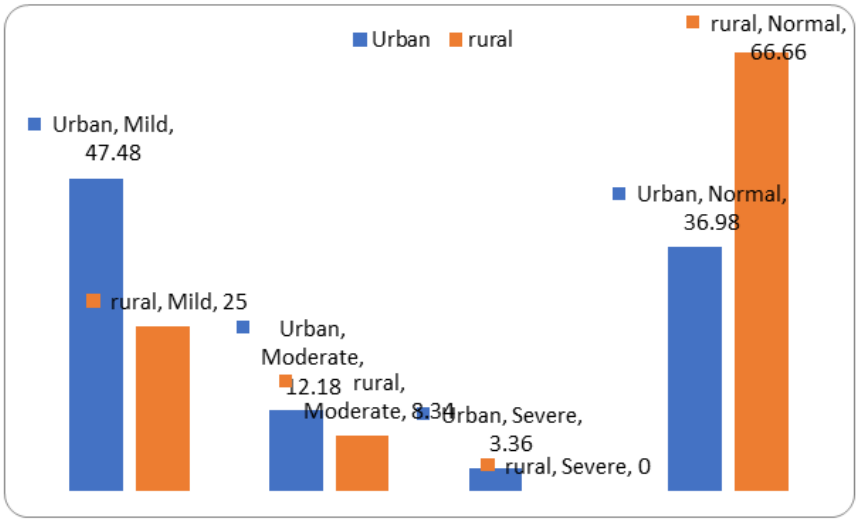

Fig-4: Shows the degree of anemia among pregnancy according to their Residence in percentage

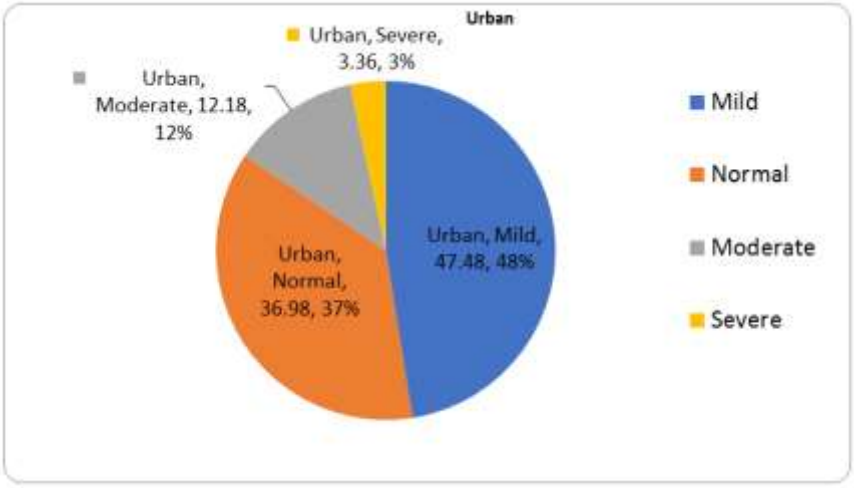

Fig-5: Shows percentage of urban pregnant women with different degree of anemia

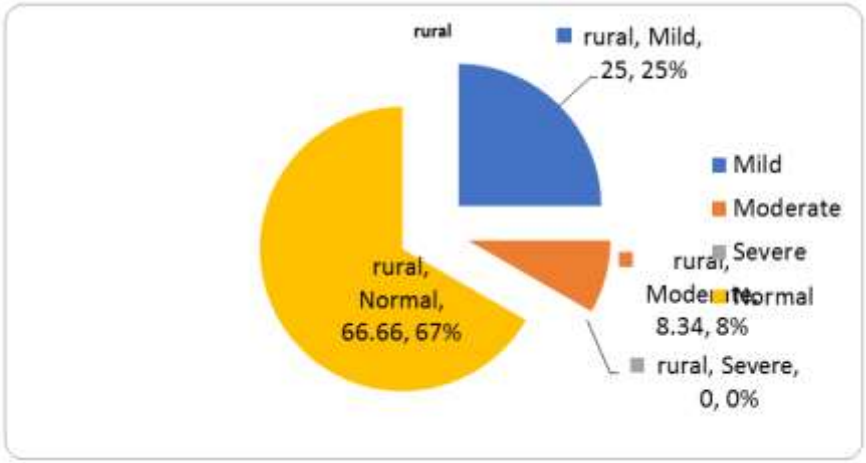

Fig-6: Shows percentage of rural pregnant women with different degree of anemia

Table-6: Shows the number and percentage of the degree of anemia among pregnant women and their Educational level

Educational level	Mild		Moderate		Severe		Normal		Total
	No.	%	No.	%	No.	%	No.	%	
Primary	59	43.08	13	9.49	4	2.91	61	44.52	137
Secondary	16	40.0	9	22.5	4	10.0	11	27.5	40
Graduated	24	50.0	5	10.42	0	0.0	19	39.58	48
Uneducated	17	68.0	3	12.0	0	0.0	5	20.0	25
Total	116		30		8		96		250

X^2=20.767 DF=9 p value = 0.013726

The majority (90%) of the cases that reported are educated in different level (primary, secondary or graduated). And the others are uneducated with (80%) of them have low Hb level.

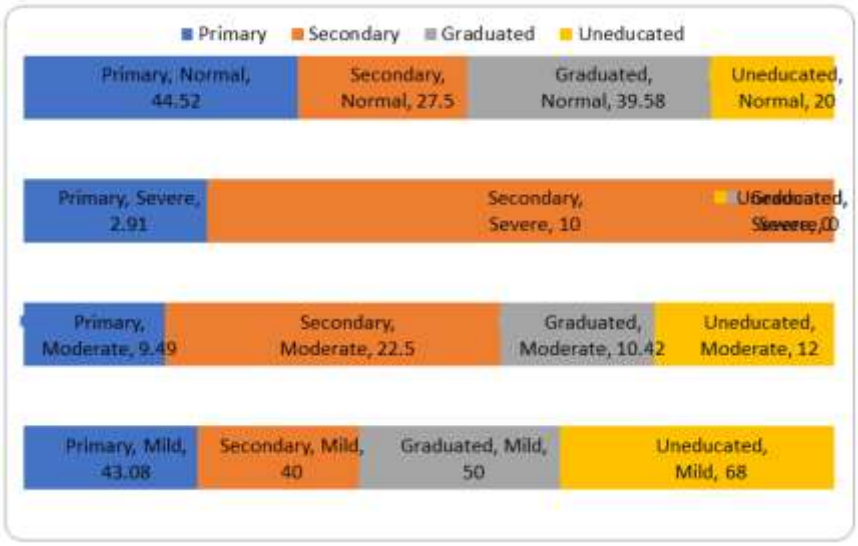

Fig-7: Shows the number and percentage of the degree of anemia among pregnant women and their Educational level

Table-7: Shows the percentage of the pregnant women with multiple pregnancies according to the degree of anemia

Multiple pregnancy	Mild		Moderate		Severe		Normal		Total
	No.	%	No.	%	No.	%	No.	%	
Yes	5	45.45	0	0.0	1	9.1	5	45.45	11
No	111	46.45	30	12.55	7	2.92	91	38.08	239
Total	116		30		8		96		250

X^2=2.776 DF=3 p value = 0.427466

Among the all (250) pregnant women only (11) of them have multiple pregnancy and (54.5%) of women with more than one fetus have anemia.

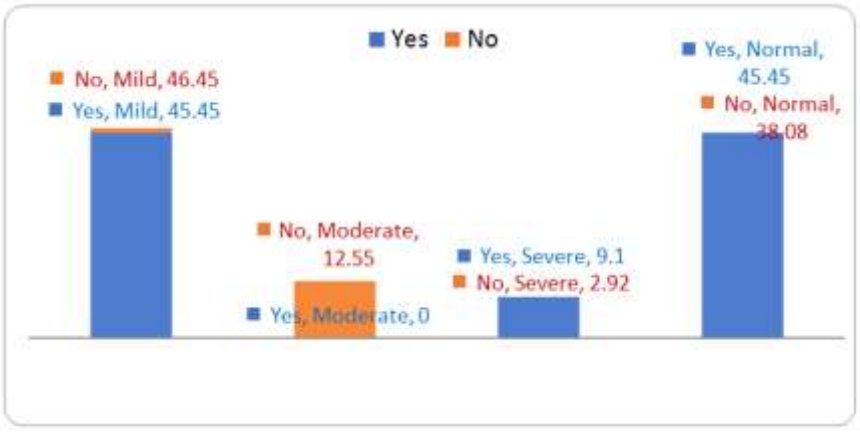

Fig-8: shows the percentage of the pregnant women with multiple pregnancies according to the degree of anemia.

DISCUSSION

This is cross sectional study which applied on 250 samples of different age groups, residency, pregnancies, levels of education, trimesters, patterns of antenatal care, and level of hemoglobin to know the prevalence of anemia in Kirkuk city.

The world health organization report gives anemia prevalence picture at global level at 52% in the developing countries compared with 23% in the developed countries [10].

The prevalence of anemia in pregnancy in this study is 61.6% which is similar to the 37-56% given by the WHO. Using the criterion of hemoglobin concentration <11g/dl to define anemia [26, 27].

The overall prevalence of mild anemia in the first trimester in this study was 11.6% while that of moderate one 2.4% and no cases of severe anemia, while in second trimester mild anemia was 19.6%,moderate 4% and severe 1.2% and in the third trimester mild anemia 15.2%, moderate 5.6 and severe anemia 2% Compared with other recent studies from Jordan, in the first trimester mild anemia 39.5%, moderate 7.2% and severe anemia 0.3% while in the second trimester mild anemia 44.4%, moderate 9.6% and severe anemia 2.1% and in the third trimester mild anemia 51.1%, moderate anemia 12.6% and severe anemia 3.2% [28].

As a result the percentage of anemia in Jordan is higher in all trimesters than our community.

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