Prevalence of bad outcome among VLBW in Tikrit city and its associated maternal risk factors

Yossra Saleh Khudhur

Department of Obstetrics and Gynecology, College of Medicine, University of Tikrit.Tikrit.Iraq.

ABSTRACT

Objectives:-To know the maternal risk factors that affect the VLBW and to determine the outcome of the VLBW infants.

Patients and methods: - A cross sectional study extended from january2013 to June 2014. During which, about 100 mother with their babies were collected from delivery room, theatre and neonatal care unit of Tikrit teaching hospital. The data were taken by direct interview with the mothers by a special questionnaire include variables in the maternal history considered as a major risk factors for VLBW infants like mothers age ,parity , systemic disease…etc..

Results:- A total sample of 100 singleton mothers with their babies were studied according to maternal and environmental factors, maternal past and recent obstetric histories and according to the characteristics of the newborns and their outcome.The sample distribution according to the general characteristics show that most of theVLBW babies were born to mothers aged 26-35 years old,35(35%). Most of the VLBW born to non-smoker mothers, 44(44%) of babies born to mothers with drug supplement. About 76(76%) of the mothers were multiparous.About 63(63%) women were have no PTL, about 26(26%) of mothers had history of leaking liquor, while 33(33%) had history of fever, 76(76%) had NVD. The most common systemic disease was hypertension found among 25(25%) of mothers. The prevalence of died babies amongVLBW babies was43(43%) ,as compared with 57(57%) those who discharged well.

Conclusion: - The results of our study showed that variables which are regarded as maternal risk factors for VLBW are younger maternal age, maternal systemic diseases especially hypertension, maternal fever.

Introduction

Birth weight is a powerful predictor of infant growth and survival. Infants born with a low birth weight begin life immediately disadvantaged and face extremely poor survival rates. Approximately every ten seconds, an infant from a developing country dies from a disease or infection that can be attributed to very low birth weight. The birth weight (BW) is an important determinant of the chance of the newborn to survive and experience healthy growth and development. Baby's weight is strongly associated with mortality risk during the first years and, to lesser degree, with developmental problems in childhood and the risk of various diseases in adulthood (1).

Very low birth weight (VLBW) is a term used to describe babies who are born weighing less than 1,500 grams (3 pounds and 4 ounces) only a few

babies , 10.5% are born this tiny . however, the overall rate of very low birth weight babies in the US is increasing . this is primarily due to the greater numbers of multiple birth babies who are more likely to be born early and weigh less . Virtually, all VLBW babies are preterm (2).

Preterm deliveries of babies weighing less than 1500grams (VLBW) are of major concern because of maximum perinatal morbidity and mortality found in this group. (VLBW) babies overload the neonatal intensive care unit (NICU) and their mortality contributes significantly to neonatal and infant mortality. Very low birth weight is also commonly used term to describe premature infants (3).

When compared with term infants, (VLBW) neonates have a higher incidence of rehospitalization during the first year of life for sequelae of prematurity, infection, neurologic complications, and psychosocial disorders .babies with VLBW, look much smaller than other babies of normal birth weight (4). A VLBW baby's head appears to be bigger than the rest of the body and he/she often looks extremely thin, with little body fat .the skin is often quite transparent, all owing the blood vessels to be easily seen. The primary cause of VLBW is premature birth (born before 37wks of gestation) VLBW babies are often born before 30 wks.of pregnancy .being born early, mean a body has less time in the mothers uterus to grow and gain weight. Much of body's weight is gained during the latter part of pregnancy .another cause of VLBW is intrauterine growth restriction (IUGR) (5). IUGR is defined as a rate of fetal growth that is less than normal for population and for the growth potential of a specific infant. Specific treatment of very low birth weight will be determined by baby's physician based on: baby's gestational age, overall health, and medical history. Baby's tolerance for specific medications, procedures, or therapies (6).

The very low birth weight is a concern because a baby with very low birth weight is often at increased risk for complication. The baby's tiny body is not as strong and he /she have a harder time eating, gaining weight, and fighting infection. Prevention of preterm births is one of the best ways to prevent very low birth weight. Prenatal care is a key factor in preventing preterm births and very low birth weight babies. At prenatal visits, the health of both mother and fetus can be checked (7).

Very low birth weight infants may not catch up, especially if they have severe chronic sequelae , insufficient nutritional intake or an inadequate care taking environment , premature birth in itself may prejudice late development (8). In general , the greater the immaturity and the lower the birth weight , the greater the likelihood of intellectual and neurologic deficit , as many as 50% of 500-750g infants have a significant neurodevelopmental handicap (blindness , deafness , mental retardation , cerebral palsy) VLBW is caused by preterm birth, intrauterine growth restriction , or both factors , any factors affect the duration of gestation and of fetal growth and thus , the birth weight.They relate to the infant, to the mother or to the physical environment (9) . Maternal factors include : maternal age , maternal height and weight , parity , short spacing , weight again , oligohydramnios ,polyhydramnios , multiple gestation , previous obstetric history , antenatal care attendance , maternal work and exercises , maternal diseases like anemia , hypertension and renal disease , heart disease and

chronic pulmonary disease , diabetes mellitus(10) .

Materials and Methods

This study is a cross –section study. it was conducted in Tikrit teaching hospital between January 2013 and June 2014 where about 100 pregnant women who were at the second and third trimester of pregnancy were enrolled in this study after taking a verbal consent during attending Tikrit teaching hospital. Demographic and obstetric data were recorded on special forms for each participant. Gestational age determination was based on precisely recalled menstrual dates as they were having regular menstrual cycles, and further confirmed by their first or early second trimester ultrasound. Newborn babies were examined for sex, presence of congenital anomalies. Birth weight was measured immediately after delivery using a standard beam scale .The babies were naked while weighed. A maximum birth weight that were included in the study was 1500 gram, while the minimum birth weight was 1000 gram.

Data were analyzed using the statistical package for social sciences (SPSS version 11) the data was presented as numbers, percenages,frequency tables, graphs, chi-square test was used to measure statistical significance p-value of < 0.05 indicated the level of significance.

Results

The sample distribution according to the general characteristics show that most of the VLBW babies was born to mothers aged 26-35 years old 35(35%) followed by ≥ 36 years old 23(23%), and for house wife 42(42%), followed by employer 30(30%), as shown in table 1.

Most of theV LBW born to non-smoker mothers and only 3(3%) born for a smoker mothers, 44(44%) of the babies born to mothers with drug supplement as compared with non - supplemented mothers 56(56%), as shown in table 2.

Table 3 show the distribution of the sample according to the recent obstetrical history, about 76(76%) of the mothers were multiparous, vs 24(24%) of the primiparous. About 63(63%) women have no PTL, versus 37(37%) had. About 26(26%) of mothers had history of leaking liquor shown fig (1), 33(33%) had history of fever, 76(76%) had NVD, and 24(24%) had C/S.

The most common systemic diseases was hypertension found among 25(25%) of mothers, Anemia 23(23%), renal disease 3(3%), as shown in table 4.

The prevalence of died babies among VLBW babies was 43(43%), as compared with 57(57%), those who discharged well, as shown in figure 2.

The most died outcome found among the age group ≥36 years old 9(56.5%), followed by 18-20 years old 13(42.9%), while it was found among employer mothers 15(50%), followed by house wife 17(40.5%), then student 11(39.3%), as shown in table 5.the both relations wasn't statistically significant.

3(100%) of smoker mothers babies died versus 40(41.24%) of non-smokers, this relation was statistically significant P value <0.05, 25(56.8%) of those with drug supplement as compared with non- supplied 18(32.1%), this relation was statistically significant P value <0.05,

and 15(53.6%) of those born to mothers with previous history of VLBW was died, as shown in table 6.
The died babies was more common among multiparous 33(43.4%) than primiparous10(41.7%), this relation was statistically not significant P value > 0.05, more common among PTLpatients 20(54.1%) than non 23(36.5%), this relation was statistically not significant P value > 0.05. most of the mothers with history of leaking liquor 17 (65.4%), and those with fever 19(57.6%) had bad outcome of VLBW baby, these two relations were statistically significant P <0.05. patient delivered with C/S 11(45.8%) were more liable to had died babies as compared to NVD 32(42.1%), this relation was statistically not significant P value > 0.05,as shown in table 7.

Babies of mothers with renal disease were significantly (p value <0.05) more liable to have bad outcome 3 (100%), those with hypertension 11(44%), anemia 10(43.5%) cardiac disease 1(100%), thyroid disease 2(100%), these relations were statistically not significant P>0.05, as shown in table 8.
For testing the risk of each of previous factors on predicting bad outcome , we calculate the Odds ratio(OR), and found that the risk for having bad outcome was 2.4 times for mothers with renal disease , 2.43 times for history of fever and smoking, history of leaking liquor 3.5 times, drug supplement 2.8 times, these relation was statistically significant. The primiparous have 0.93 times of the risk of multiparous. When studing the age each age group was compared with the ideal age for pregnancy 21-25 years we found that the age edges 18-20 years and ≥ 36 years have more risk 1.95, and 1.13 respectively. For occupation it was 1.5 for employer mother and 0.95 for student of the risk of house wife mothers, these relations was statistically not significant , as shown in table 9.

Discussion

Although of consistent effort to improve the quality of maternal and child health, the overall rate of VLBW is increasing throughout the world. It account for about 50% of neonatal deaths, and their survival directly related to the birth weight (11). This study has been undertaken to define the extent of VLBW problem in the Tikrit city and investigate the maternal factors associated with this condition and their correlation with the outcome of the VLBW babies.

In this study, it has been found that the younger age group mothers have high number of VLBW in comparison to mothers with advanced age as seen in table (1). Similar finding were reported by Madani et al in Taif City, Saudi Arabia and Bondevik et al in Scandinavia (12) (13) .

This may be due to the effect of young maternal age on fetal growth and health through direct competition for nutrients. Also this may be due to impairment of uteroplacental perfusion of nutrients in very young women (14) .This finding is disagreed by(Kirchengast S, et al) who observed that adolescent mothers showed no increased incidence of VLBW problem (15). This may be due to the fact that a better age for childbearing is around the eighteenth.

On the other hand, a study conducted on four ethnic groups in the United States by wall et al (16), detected that most women with VLBW babies were more than 35 years old, and a study of Janet W. Rich-Edwards et al show that VLBW increased with advanced mother age (17). While a study of Hosain et al showed that women less than 20 years and above 35 years old were more commonly gave VLBW babies (18). This disagreement might be due to the difference in

socioeconomic standards of the population.

No significant association was found between mother age and the outcome of the VLBW babies in this study, while in other study, they found a significant association between VLBW babies' outcome and maternal age (19). Regarding maternal job, this study found that housewives mothers were more prone to deliver VLBW babies, this disagree with the finding of M. Khaskeli et al (20). It has been found no significant association between maternal job and the VLBW neonate's outcome. This result was disagreeing with the finding of ANNE M. et al (21).

There are also a significant relationship between maternal systemic diseases and giving birth to VLBW babies, where maternal hypertension has the highest number of the study sample followed by the anemia. Concerning hypertensive disorders, the present study demonstrated an increased risk of having VLBW babies among mothers with hypertension. This result goes with the findings obtained by Rafati et al (22).

This study may be explained the results as the uteroplacental blood flow was decreased in pregnancies complicated by maternal hypertensive disorders which affect the growth and status of placenta as well as fetal growth. Also there is increase in the deliveries of VLBW babies to mothers with renal disorders including the UTI's. These finding goes with the study of F. eghbalia in Hamadan (23).

In this study, there was no significant correlation between maternal systemic diseases and the outcome of VLBW babies, which disagrees with the result of Isaksen CV et al (24), study who found a significant correlation between VLBW death and maternal systemic diseases. Also disagrees with the finding of Juanita Graham et al (25), which shows that there is significant association between maternal systemic diseases and negative birth outcomes regardless of maternal race.There was no significant correlation between the maternal educational level in this study and the outcome of VLBW babies, in contrast to the significant correlation which is shown by Holly a et al (26). Probably the reason behind result due to psychological and social stress and some sort of difficulties that may be accompanying learning process in this country.

In this study, there was significant association between the maternal use of nutritional supplementation and the outcome of the VLBW babies. This may be due to the effect of the other maternal risk factors which overcome the effect of supplements. This finding agrees with Gary M et al study (27).

This study revealed a significant number of mothers have anemia, which reflect an increase risk of having VLBW neonates. similar finding obtained by Abdul-Kadir(28) .This might be due to fact that anemia may limit the amount of oxygen available for placental surface. Other explanation that anemia may predispose to preterm labor either directly or indirectly due to increased risk of infection. The direct effect is related to increased synthesis of corticotrophin-releasing hormones (CRH) as a result of tissue hypoxia, these raised level can induce maternal and fetal stress, and thus produce a risk factor for preterm labor, pregnancy-induced hypertension and premature rupture of membranes. An alternative mechanism could be that iron deficiency increases oxidative damage to erythrocyte in the feto-placental unit, which can stimulate the production of CRH. The relationship between anemia and infection may be due to adverse effects of anemia on immune function (29).

There was no correlation between maternal anemia and the outcome of VLBW babies in this study, in contrast finding was found in F.W. Lone et al (30), which shows an increase association between maternal anemia and VLBW outcome. This study shows a significant correlation between maternal cigarette

smoking and the outcome of the VLBW babies, as shown in Arnaud Chiolero et al (31).

This study shows that high number of study sample mothers who gave birth to VLBW babies are multigravida, while the rest of the sample are primigravida. This finding agrees with that of Phung et al who showed that incidence of VLBW babies increases with high parity mothers (32). In this study there was no significant correlation between parity and VLBW outcome.

There was significant correlation between the history of leaking liquor in the mothers enrolled in study and the outcome of the VLBW babies. This finding disagree with finding of Jillian Coolen et al which shows no association between leaking liquor and any other outcomes like neonatal morbidity and mortality (33), But agree with the finding of Shehla Noor et al (34), that showed a great association between history of leaking liquor and the increased fetal morbidity and mortality.

This study also reveals a significant association between maternal fever and VLBW babies outcome and, high number of mothers enrolled who gave birth to VLBW babies do that by vaginal delivery , while the rest by cesarean section . In this study, there was no association between VLBW outcome and the mode of delivery. This finding goes with finding of Sonkusara et al in India (35).

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Table 1: General characteristics of study sample.

Characteristics	Frequency	Percent
Age		
18 -20 years	21	21.0
21-25 years	21	21.0
26-35 years	35	35.0
≥ 36 years	23	23.0
Occupation		
employer	30	30.0
student	28	28.0
House wife	42	42.0
Total	100	100.0

Table 2: The environmental factors.

	Frequency	Percent
Smoking		
yes	3	3.0
Hx of Drug supplement		
yes	44	44.0
Total	100	100.0

Table 3: the distribution of the sample according to recent obstetrical history

recent obstetrical Hx	Frequency	Percent
Parity		
Primiparous	24	24.0
Multiparous	76	76.0
PTL		
yes	37	37.0
Hx of leaking liquor		
yes	26	26.0
Hx of fever		
yes	33	33.0
Mode of delivery		
NVD	76	76.0
C/S	24	24.0
Total	100	100.0

Table 4: systemic diseases of the mother.

Systemic disease		Frequency	Percent
Hypertension	yes	25	25.0
Anemia	yes	23	23.0
Cardiac disease	yes	1	1.0
Renal disease	yes	3	3.0
Thyroid disease	yes	2	2.0
Total		100	100.0

Table 5: T he effect of general characteristics on outcome of VLBW

Characteristics	Died		Discharge well		x2,p value
	Frequency	Percent	Frequency	Percent	
Age					
18-20 years	13	42.9	10	57.1	2.6,0.45
21-25 years	14	33.3	66.7	36.84	
26-35 years	7	40	14	60	
≥36 years	9	56.5	12	43.5	
Occupation					
Employer	15	50	15	50	0.87,0.648
House wife	17	40.5	25	59.5	
student	11	39.3	17	60.7	

Table 6: The effect of environmental and past obstetric history on outcome of VLBW

Environmental factor & past obst.	**Died**		**Discharge well**		**x2, p value**
	Frequency	**Percent**	**Frequency**	**Percent**	
Smoking					
yes	3	100	0	0	4.1, 0.04 S
Hx of Drug supplement					
yes	25	56.8	19	43.2	6.12, 0.01 S
Hx of previous Hx of VLBW					
yes	15	53.6	13	46.4	1.77,0.18
Total	43	43	57	57	

Table 7: The effect of obstetric history on outcome of VLBW.

obstetric Hx	Died		Discharge well		x2,p value
	Frequency	Percent	Frequency	Percent	
Parity					
Primiparous	10	41.7	14	58.3	0.023,0.88
Multiparous	33	43.4	43	56.6	
PTL					
yes	20	54.1	17	45.9	2.93,0.8
Hx of leaking liquor					
yes	17	65.4	9	34.6	7.18,0.007 S
Hx of fever					
yes	19	57.6	14	42.4	4.3,0.039 S
Mode of delivery					
NVD	32	42.1	44	57.9	0.1,0.7
C/S	11	45.8	13	54.2	
Total	43	100.00	57	100.0	

Table 8: The effect of systemic diseases on outcome of VLBW.

Systemic disease		Died		Discharge well		x2,p value
		Frequency	Percent	Frequency	Percent	
Hypertension	yes	11	44	14	56.0	0.14,0.9
Anemia	yes	10	43.5	13	56.5	0.003,0.95
Cardiac disease	yes	1	100.0	0	0.0	1.3,0.24
Renal disease	yes	3	100.0	0	0.0	4.1,0.04 S
Thyroid disease	yes	2	100.0	0	0.0	2.7,0.1

Table 9: The OR for different factors effect on VLBW outcome.

Variables	OR	95% Confidence Interval		P value
		Lower	Upper	
Thyroid disease	2.39	1.893	3.019	2.7,0.1
Cardiac disease	2.357	1.874	2.965	1.3,0.24
Anemia	1.026	0.401	2.625	0.003,0.95
Hypertension	1.056	0.424	2.63	0.14,0.9
Renal disease	2.42	1.912	3.075	**4.1,0.04 S**
History of fever	2.43	1.037	5.701	**4.3,0.039 S**
Smoking	2.43	1.912	3.075	**4.1, 0.04 S**
NVD/CS	0.86	0.341	2.163	0.1,0.7
PTL	2.046	0.896	4.67	2.93.0.8
Leaking liquor	3.5	1.364	8.913	**7.18,0.007 S**
Drug supplement	2.8	1.225	6.299	**6.12, 0.01 S**
previous VLBW	1.8	0.751	4.376	1.77,0.18
Primiparous	0.93	0.367	2.358	0.023,0.88
Age				
18-20 years	1.95	0.671	5.664	1.5,0.22
26-35 years	0.75	0.242	2.325	0.24,0.62
≥ 36 years	1.13	0.375	3.371	0.04,0.8
21-25 years	1			
Occupation				
employer	1.5	0.572	3.781	0.64,0.42
student	0.95	0.358	2.528	0.01,0.9
House wife	1			

Figure 1 show that about 28(28%) of the mothers had previous history of VLBW.

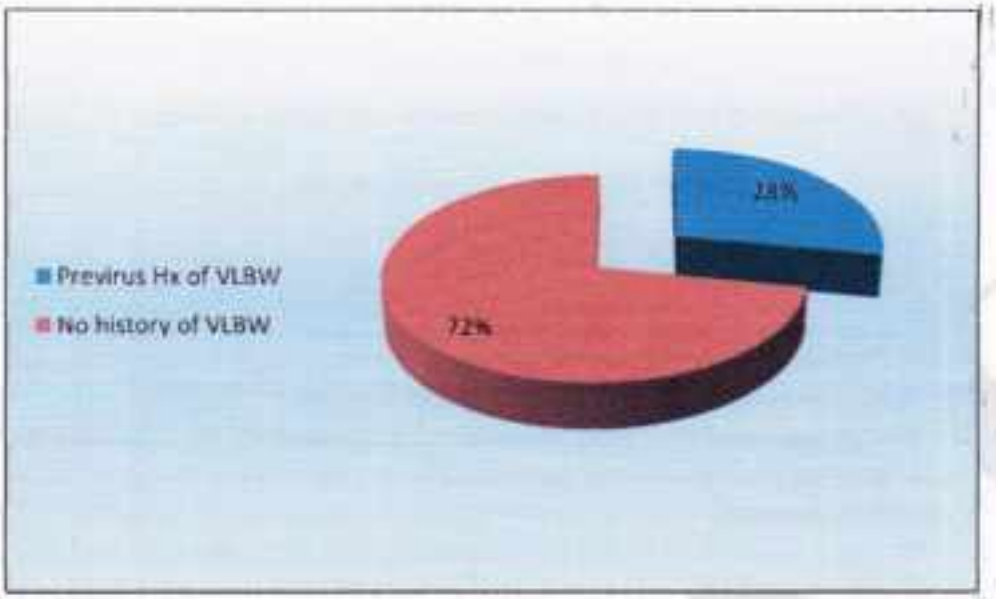

Figure 1: The past obstetric history of VLBW.

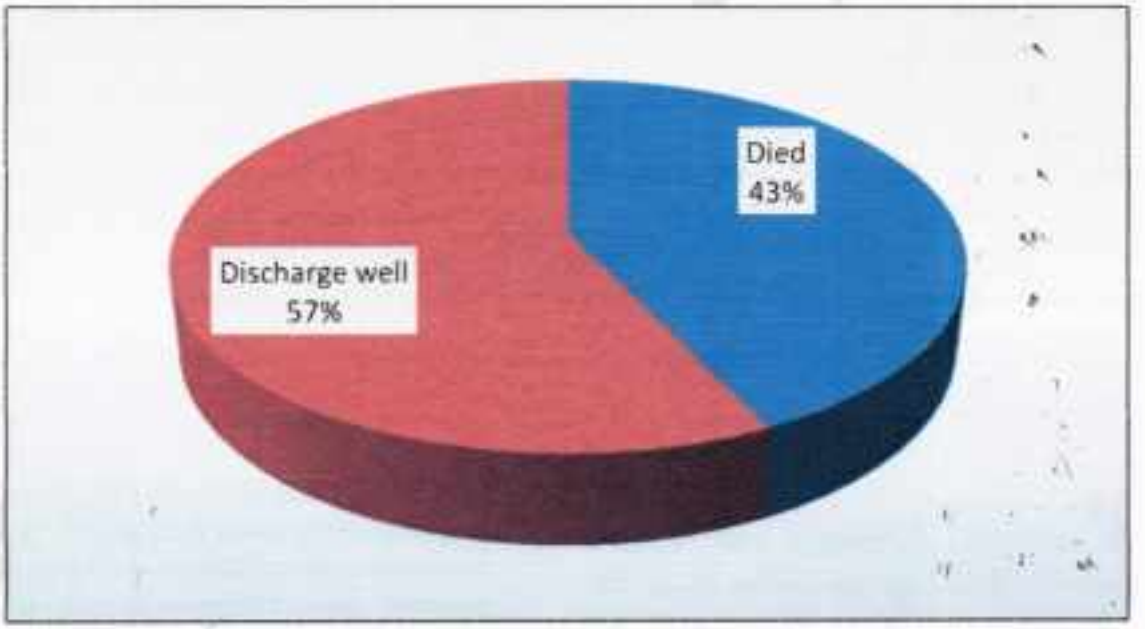

Figure 2: The prevalence of died babies among VLBW babies.