ADVERSE PREGNANCY OUTCOME IN BAGHDAD CITY

Dhafer B. Al-Yuozbaki,
PH.D. community medicine, Department of Family and community medicine, College of Medicine,
Al-Iraqia University /Iraq
email-adress: dhaferyouzbaki@gmail.com

Abstract:

Background: Low birth weight, macrosomia, preterm delivery, post-term birth, intrauterine death, and congenital deformities are all major public health concerns that can result in severe impairments, diseases, and life-long morbidity and mortality in adverse pregnancy outcomes of the newborns. Pregnancies are planned in most modern countries, and the outcome for both mother and child is often positive. The death of the mother or her offspring is the most serious negative consequence of pregnancy. This study is conducted in two major hospitals in Baghdad city for obstetric services for the period extended from 1st February 2019 to 1st of November 2019. This study aimed to determine the prevalence of adverse gestational outcomes in Baghdad city, Iraq and its predictors.

Method: A cross-sectional study design was adopted for this study to determine the prevalence of unwanted gestational outcomes in Baghdad city. Furthermore, risk factors were calculated by adopting a case-control study design for data of this study.

Results: The prevalence of unwanted pregnancy outcome in Baghdad city was found to be 24.7% of total births and low birth weight was the major risk factor in addition to macrosomia, post-term birth, preterm birth, intra-uterine death and congenital malformation respectively.

Conclusion: The high rate of unwanted gestational outcomes in Baghdad city required an urgent intervention by health authority in form of preventive measure to control risk factors of this health problem.

INTRODUCTION:

From pregnancy through the birth of a healthy baby, a successful reproduction depends on a series of circumstances. Obstacles that develop during the reproductive process will eventually result in adverse pregnancy outcomes [1]. When a viable sperm reaches the ovum and progresses to implantation, it is called conception. Normal development in the first few weeks of life is dependent on cell distinctiveness and migration, which must occur at precise times, leading to the creation of organ systems and subsequent fetal growth. Any deviation from this sequence can be considered a negative pregnancy outcome [1]. Even if the woman and the baby survive, pregnancy complications and problems (during delivery and after the baby is born) are prevalent and can result in severe maternal and newborn morbidity [2]. Several adverse outcomes are defined as the failure of something to occur at the right time e.g. when the neural tube does not fully close, spina bifida will result. Some adverse outcomes are defined by normal events occur in the wrong time such as preterm and post-term deliveries of live births. Some adverse birth outcomes such as low birth weight and prematurity

are associated with increased infant morbidity and mortality [3]. Generally, neonatal mortality and morbidity can be attributed to maternal disorder, fetal & placental pathology or any other complications during delivery [4].

Indicators of adverse pregnancy outcomes includes; 1- Low birth weight (LBW) "is defined by WHO as a birth weight less than 2500 g", Mortality is 40 times more common in LBW and is 200 times more common in very LBW (weight less than 1500gm). 2- Macrosomia (high birth weight "HBW") which is defined by WHO as birth weight more than 4000 gm. HBW will lead to increase perinatal mortality, brachial palsy, muconium aspiration, clavicular fracture, shoulder dystocia, low apgar score[5,6]. 3- Pre-term birth; is defined by WHO as birth that occur before 37 and after 24 completed weeks of gestation, preterm delivery account for about 65%of neonatal death and 50% of neurological disability in child hood. 4- Post-term birth which is defined by WHO as birth that occur beyond 42 completed weeks of gestation. Although it occur in less than 5% of all births, it is responsible for 30% of perinatal deaths. 5- Still birth (Intra-uterine fetal death) which is defined by WHO as intra-uterine fetal

death after 24 weeks of gestation. 6- Congenital malformation is stated by WHO should be confined to structural defect at birth and the term congenital anomalies being used to include all biochemical, structural and functional disorders present at birth[1,2,7,8].

Risk agents for unwanted pregnancy outcomes, include; Maternal age (more than 35 years and less than 16 years), High parity (more than 5 pregnancies), Spacing (inter-pregnancy time less than 12 months and more than 59 months), Bad ante-natal care, Ante-partum hemorrhage, pregnancy induced hypertension, gestational diabetes mellitus, lack of supplementations during pregnancy (iron and folic acid), bad past obstetric history (previous unwanted pregnancy oyutcomes, IVF, infertility), chronic diseases (DM, HT, IHD and other), low maternal educational levels[9-14].

Patients and Methods:

Study Setting: The present study was conducted in Baghdad city, in two governmental hospitals which provide obstetric and gynecological care. These are: AL-Elwiaya Teaching Hospital on the right side of Baghdad city, and AL-Karck Obstetric hospital on the left side of the city. Study Design: In order to fulfill the study's aim, a descriptive hospital based, cross-sectional study design was adopted. All births were examined at the same time (normal and abnormal births), then, the prevalence was detected (abnormal births outcomes among normal births). This design determines both exposure and disease outcomes for each individual at the same time, similar to looking at a "snapshot" of the population at a specific point in time. Then, the analysis of each risk factor in relation to the adverse outcomes was done by unmatched case-control study design where the sample was divided in to two groups: women whose newborns have adverse birth outcomes and women without adverse birth outcomes of the newborns.

Participants: The participants were pregnant women, whose ages are 14-49 years, admitted to the four hospitals, where the data were collected, for delivery after 24 weeks from gestation. The adverse pregnancy results were determined by the following parameters: (Low birth weight, macrosomia, preterm births, post-term births, stillbirths and congenital malformations).

'**Definition of Cases:**
1. The participant must be pregnant woman (14-49 years) after 24 weeks of gestation.
2. The newborn has adverse birth outcome.

Definition of Controls:
1. The participant must be pregnant woman (14-49 years) after 24 weeks of gestation.
2. The newborn does not have adverse birth outcome.

Preliminary Preparation of the Data Collection Form: At the start of the study, a preliminary questionnaire form

was constructed & the following points was taken into consideration: The questionnaire form was examined by a committee of six specialists in the fields of community medicine, family medicine, and medical statistician in the Department of Family and Community Medicine, College of Medicine, University of Al-Iraqia and it was 88%.

Specimen Size Determination by utilizing the formula:
$n = (Z2 \times P \times q)/ d2$
;where

n Required sample size
Z Confidence level at 95% (standard value of 1.96)
P Estimated prevalence of adverse pregnancy outcome in the project area
d Margin of error at 5% (standard value of 0.05)
q 1-p

$n = (1.96)^2 \ pq \ /(p)^2$
Were q=1-p
$n = (1.96)^2(.50)(1-0.50)/(.05)$
$n = (3.8416)(0.5)(0.5)/0.0025$
$n = (3.8416)(0.25)/0.0025$
n=0.9604/0.0025 =384

In order to take two sides table of calculation, it is decided to take a double sample size from equation to be 800 and 200 is added to avoid any missed data. The final decision was the sample size to be equal to 1000 subject distributed from both hospitals.

Data collection period is extended from 1st February 2019 to 1st of November 2019.

Ethical consideration: Approval from Baghdad health office and hospitals will be first taken to facilitate data collection needed for this work in these hospitals. Furthermore, each participant in the study will provide oral consent. Participants' names will not be captured, only their code numbers, and all data will be treated with care. Nonetheless, the study's purpose and aims were conveyed to all participants, and all ethnic and religious traits were ignored in the end. After obtaining an oral consent from each participant, data were obtained directly from the delivered women by direct interview which was done by the researcher in the post labor rooms or gynecological wards of these hospitals by a detailed questionnaire form constructed to cover the questions in the form.

Data Management and Statistical Analysis: Statistical analysis were conducted with personal computer Pentium IV by using XP windows, SPSS version 11.5 and EXCEL program under windows. Standard statistical methods were used to measure means, standard deviations, numbers and percentages. X^2 test was done to determine whether or not there was an association. Odd ratio with its 95% CI was calculated & p-value of less than or equal to 0.05 was considered statistically significant.

RESULTS:

Prevalence of Adverse Pregnancy Outcomes for Newborns: 247 pregnancies out of the total sample (1000) found to be with unwanted pregnancy outcome. Thus, the prevalence of adverse pregnancy outcomes in Baghdad City / Iraq is 24.7%,
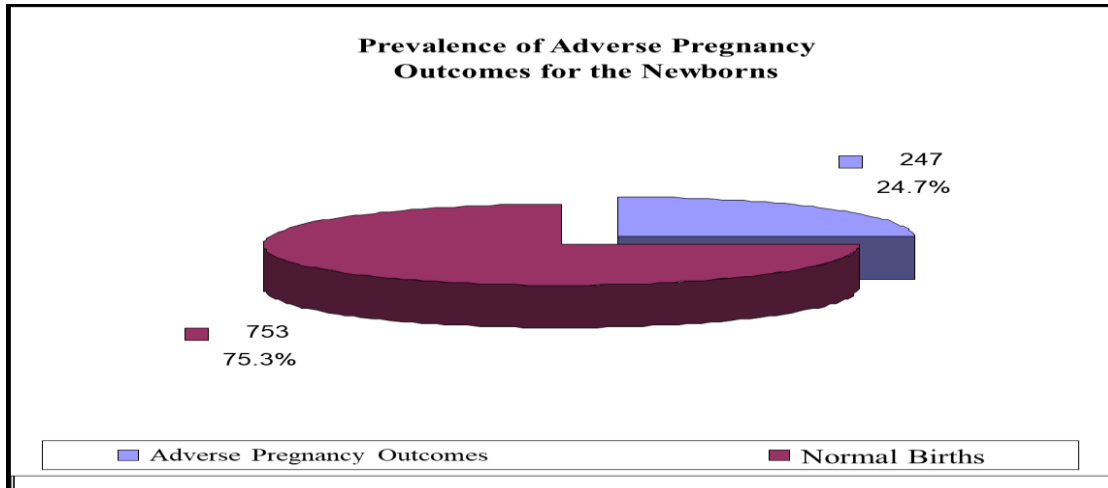
1- Figure (1) Total Prevalence of Adverse pregnancy Outcomes: n = 1000

Prevalence of Different Adverse pregnancy Outcomes: Figure (2) shows the distribution of different types of unwanted pregnancy outcomes among the study sample, where, LBW appeared to be with highest level (7,3%) and Intra-uetrine death at lowest level (1.9%)
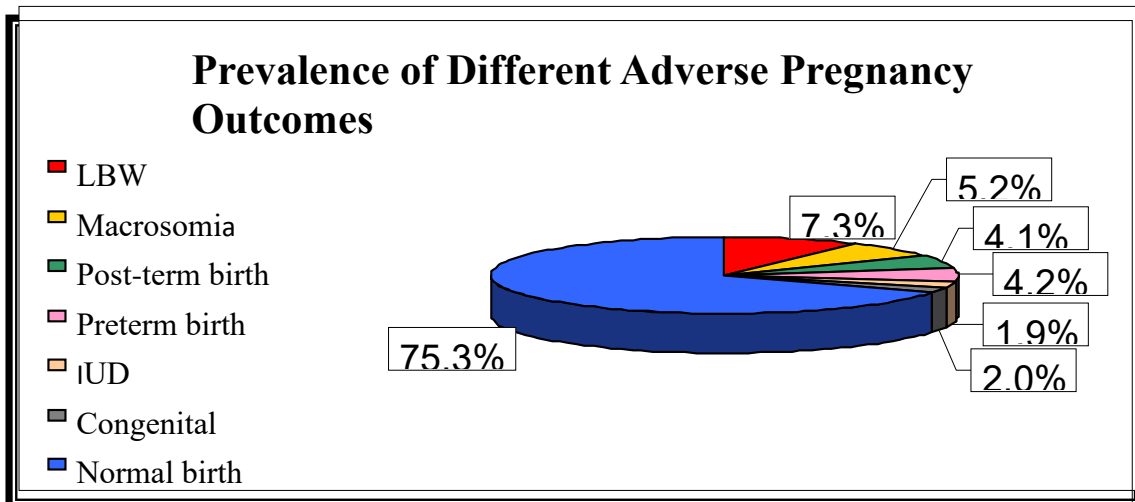

Figure (2): Types of different unwanted pregnancy outcomes

Distribution of risky factors in unwanted pregnancy outcomes among study population **:** table(1) shows there was a significant relation between both groups in relation to predisposing risk factors understudy like age, APH, parity and so on .

Table number (1): Distribution of risky factors in unwanted pregnancy outcomes among study population

Personal characteristics	Cases (n=247)		Controls (n=753)		OR	p-values	95% C.I.
	No.	%	No.	%			
Age ≤ 19 years	18	7.3	102	13.6	0.50	0.009	0.29-0.84
Parity ≥ 5	64	25.9	114	15.1	1.9	0.000	1.39-2.74
Bad antenatal care (No visits)	18	7.3	26	3.5	2.2	0.01	1.19-4.05
Antepartum hemorrhage (APH)	23	9.3	25	10.1	2.9	0.000	1.68-5.34
HDP	68	27.5	138	55.9	1.7	0.002	1.21-2.36
Previous adverse outcome(s)	45	18.2	78	10.4	1.9	0.001	1.29-2.87
Diabetes Mellitus	4	1.6	2	0.3	6.1	0.04	1.32-29.02
Illiterate Mother	43	17.4	95	12.6	1.4	0.05	0.99-2.16

Backward logistic regression model for adverse pregnancy outcomes risk factors: It was found that there was a significant relation with some factors (parity≥5, APH, Maternal Illiteracy) as show in table (2).

Table (2) Backward logistic regression model for adverse pregnancyoutcomes risk factors:

Variables	Coefficient B	S.E	P	Estimated OR(Exp b)	95% C.I for Exp b
Parity ≥5	1.451	0.368	0.0001	4.268	2.076-8.774
APH	1.212	0.382	0.0015	3.360	1.589-7.105
Maternal Illiteracy	-1.353	0.406	0.0009	0.259	0.117-0.573
Constant	0.041				

Backward logistic regression model for adverse pregnancy protective factors shows there was a significant relation between adverse pregnancy outcomes protective factors (Age, Parity 1-4, Multi-generational family).

Table (3): logistic regression analysis.

Variables	Coefficient β	S.E	P	Estimated OR (Exp b)	95%C.I for Exp b
Age ≤19	0.999	0.314	0.0014	2.717	1.469-5.022
Parity 1-4	-1.853	0.502	0.0002	0.157	0.059-0.419
ANC	0.647	0.325	0.046	1.909	1.011-3.609
Multi-generational family	1.562	0.473	0.002	4.314	1.706-10.909
Constant	0.425				

DISCUSSION:
In Baghdad city, the total prevalence of poor pregnancy outcomes among newborns was (24.7 %) which represents one quarter of the population and it is relatively acceptable.

The highest prevalence among all adverse pregnancy outcomes was for the low birth weight (7.3%), followed by macrosomia (5.2%), then post-term and preterm births (4.1%, 4.2%) respectively. Intrauterine death had a prevalence of (2.1%) and congenital malformations had the lowest prevalence (2.0%),

relatively the same same results was found by Lisonkova S et al by his study[15].

Grand-multipara mother, appeared in this study to have an increased risk in a highly significant and way for the adverse pregnancy outcomes. This went in accordance with results of research of Lisonkova [16].

Only (4.4%) of the total study sample had no visits to antenatal clinics and this was significantly associated with increased risk for the development of the adverse outcomes while patients who had one or more antenatal visits were protected in a significant pattern. Starting antenatal booking during the first trimester significantly increased the detection of adverse pregnancy outcomes while starting the visits after the first trimester significantly decreased the risk. Similar figures were gained by Mac Dorman et al in his research in USA at 2004[17].

The development of antepartum hemorrhage and hypertensive disorders during the present pregnancy & history of previous adverse pregnancy outcome & pre-existing diabetes mellitus were significantly associated with the occurrence from adverse outcomes of the newborn. Maternal illiteracy was a significant risk factor for the development of adverse birth outcomes. The above foundation were also obtained by the nice research of Mac Dorman et al[17].

After controlling for all other risk variables using a backward logistic regression model, several risk agents such like parity or more, antepartum hemorrhage, and maternal illiteracy were discovered to have an independent dangerous connection with the occurrence of bad outcomes[5].

RECOMMENDATIONS:

Primary preventive measures have to be taken into consideration because they are cost-effective and more beneficial than treatment; they act on risk factors which are numerous and complex. There is a necessity to develop health education strategies, e.g., premarital counseling, and to enhance screening and diagnostic procedure during the prenatal period. Additional efforts are recommended to enhance awareness in health professionals, especially in medical districts where underreporting is an obvious concern.

More studies are recommended to look for the association of each risk factor separately with the development of each or all adverse pregnancy outcomes in the near future.It is essential to advice pregnant women to avoid all the mentioned risk factors associated with the development of the adverse pregnancy outcomes and increase their awareness to such problem by both primary and primordial prevention levels.

LIMITATION

The limited duration of data collection period. Studies of longer duration for one year or more may be of value in deciding the effect of some factors that were overlooked by the limited patients' number with that factor such as the effect of diabetes mellitus and smoking on pregnancy outcomes. This study is dependent upon governmental hospital-based data and did not include deliveries at homes by midwives and at private hospitals. In spite of that, deliveries at governmental hospitals represent more than two third of all deliveries in Baghdad city. Furthermore, it was not practical to follow up deliveries that take place at homes in our locality.

REFERENCES

1. World Health Organization . Trends in maternal mortality: 1990 to 2015: estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division. *Geneva: World Health Organization; 2015.* [Google Scholar]

2. Say L, et al. Global causes of maternal death: a WHO systematic analysis. Lancet Glob Health. 2014;2(6):e323–e333. doi: *10.1016/S2214-109X(14)70227-X.* [PubMed] [CrossRef] [Google Scholar]

3. Joseph KS, Liu S, Demissie K, et al. A parsimonious explanation for intersecting perinatal mortality curves: understanding the effect of plurality and of parity. 2- 2- 2- BMC Pregnancy Childbirth. 2003;3(1):3.

4. Joseph KS, Demissie K, Platt RW, et al. A parsimonious explanation for intersecting perinatal mortality curves: understanding the effects of race and of maternal smoking. BMC Pregnancy Childbirth. 2004;4(1):7.

5. Hernández-Díaz S, Schisterman EF, Hernán MA. The birth weight "paradox" uncovered? Am J Epidemiol. 2006;164(11): 1115–1120. 13.

6. Basso O, Wilcox AJ. Intersecting birth weight–specific mortality curves: solving the riddle. Am J Epidemiol. 2009; 169(7):787–797.

7. Whitcomb BW, Schisterman EF, Perkins NJ, et al. Quantification of collider-stratification bias and the birthweight paradox. Paediatr Perinat Epidemiol. 2009;23(5): 394–402.

8. Schisterman EF, Whitcomb BW, Mumford SL, et al. Z-scores andthebirthweightparadox.PaediatrPerinatEpidemiol.2009; 23(5):403–413.

9. WilcoxAJ,WeinbergCR,BassoO.Onthe pitfallsof adjusting for gestational age at birth. Am J Epidemiol. 2011;174(9): 1062–1068.

10. VanderWeele TJ, Mumford SL, Schisterman EF. Conditioning on intermediates in perinatal epidemiology. Epidemiology. 2012;23(1):1–9.

11. Kramer MS, Papageorghiou A, Culhane J, et al. Challenges in defining and classifying the preterm birth syndrome. Am J Obstet Gynecol. 2012;206(2):108–112.

12. Wilcox AJ, Weinberg CR. Analysis of gestational-age-specific mortality—on what biologic foundations? Am J Epidemiol. 2004;160(3):213–214.

13. Klebanoff MA, Schoendorf KC. Invited commentary: What's so bad about curves crossing anyway? Am J Epidemiol. 2004; 160(3):211–212.

14. Lisonkova S, Hutcheon JA, Joseph KS. Sudden infant death syndrome: a re-examination of temporal trends. BMC Pregnancy Childbirth. 2012;12:59.

15. Lisonkova S, Joseph KS. Candidates at risk for postnatal outcomes. Epidemiology. 2012;23(6):938–939.

16. Joseph KS. Incidence-based measures of birth, growth restriction, and death can free perinatal epidemiology from erroneous concepts of risk. J Clin Epidemiol. 2004;57(9): 889–897.

17. Joseph KS, Huang L, Liu S, et al. Reconciling the high rates of preterm and post-term birth in the United States. Obstet Gynecol. 2007;109(4):813–822.

18. Mac Dorman MF, Hoyert DL, Martin JA, et al. Fetal and Perinatal Mortality, United States, 2003. National Vital StatisticsReports2007;55(6).*Hyattsville,MD:NationalCenter for Health Statistics.*