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Factors contributing to maternal mortality in the health directorate of Baghdad Al-Karkh in 2018

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Abstract

Background: Maternal mortality remains a major challenge to health systems worldwide where Pregnancy and childbirth are the leading causes of deaths among women in many developing countries. Monitoring the maternal mortality ratios and main factors contributing of maternal deaths reflect the quality of the health services which provided to the pregnant during antenatal care and postnatal period Iraq ranked 12th among Arab countries in Maternal mortality, we look forward to improve our order because most of causes are preventable and treatable.

The Aim: To determine the causes and characteristics of maternal deaths in health directorate of Baghdad Al-Karkh in 2018.

Methodology: Retrospective file based study that review all maternal deaths in health directorate of Baghdad AL-karkh in 2018, include governmental and private hospitals (22 hospitals) which contain delivery rooms and neonatal care units, maternal deaths under study were reviewed and studied by maternal committee in hospitals and health directorate early as possible, statistical analysis was computer aided using Excel software sheets 2007. Data summarized as frequencies and percentages and presented in tables and graphs.

Results: Maternal mortality ratio was 42/100000 live births, (42%) of maternal death at age groups (30-39 years), two third of maternal mortality with antenatal care during pregnancy period, (50%) of maternal mortality attendance the private clinics, (82%) of maternal mortality delivered at hospitals and (55%) of them with Cesarean sections. (82%) of maternal mortality as a result of direct obstetrical causes mainly partum hemorrhage (37%).

Conclusions: Post partum hemorrhage was the most common cause of death of pregnant women in this study, it's necessary to improve health care for pregnant women to mitigate post partum hemorrhage and its complications.

Keywords: Maternal mortality ratio, hemorrhage, governmental and private hospitals.

1. Introduction

The pregnancy is a time of many changes physiological, emotional and psychological of the mothers, which effect on the life of their family ^[1]. The World Health Organization (WHO) defines a maternal death as “the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes”^[2] This definition corresponds to the codes O00-O95 and O98-O99 of the International Classification of Diseases’ 10th revision (ICD-10 volume 2) ^[3] Maternal mortality is unacceptably high. About 830 women die from pregnancy- or childbirth-related complications around the world every day. It was estimated that in 2015 nearly 35 women died each hour during and following pregnancy and childbirth. Almost all of these deaths occurred in low-resource settings, and most could have been prevented ^[4]. Most of these maternal deaths are preventable or treatable. Other complications may exist before pregnancy but are worsened during pregnancy, especially if not managed as part of the pregnant women care. The major complications that account for nearly 75% of all maternal deaths are: severe bleeding (Mostly bleeding after childbirth), infections (Usually after childbirth), high blood pressure during pregnancy (Pre-eclampsia and eclampsia), and unsafe abortion ^[5]. These causes are the same globally, but the distributions of them vary from region to region ^[6].

The majority of maternal deaths (61%) occur in the postpartum period, and more than half of these take place within a day of delivery. An estimated 40% of pregnant women experience pregnancy-related health problems during or after pregnancy, and childbirth, with 14% suffering serious or long term complications where annually 300 million women suffer from

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pregnancy related health problems and disabilities, including anemia, uterine prolapsed, fistula, Pelvic Inflammatory Disorders and infertility [7].

About 99% of all maternal deaths occur in developing countries, where during 1990 and 2015, maternal mortality worldwide dropped by about 44%, More than half of these deaths occur in sub-Saharan Africa and almost one third occur in South Asia. The maternal mortality ratio in developing countries in 2015 is 239 per 100 000 live births versus 12 per 100 000 live births in developed countries. There are large disparities between countries, but also within countries, and between women with high and low income and those women living in rural versus urban areas. The risk of maternal mortality is highest for adolescent girls under 15 years old and complications in pregnancy and childbirth is a leading cause of death among adolescent girls in developing countries [8, 9]. So the target is to reduce the global maternal mortality ratio to less than 70 per 100 000 live births during 2016 - 2030, as part of the Sustainable Development Goals. The maternal mortality ratio in Iraq in 1990 was 117 per 100,000 live births, and reduced to 84/100000 live birth in 2007 and to 35.7/100000 live birth in 2012. These estimates rank the Iraq in territories in the 83rd place among the world countries in terms of maternal mortality ratio and in the 12th place among Arab countries, trailing behind all Gulf countries, Jordan, Tunisia, Libya and Egypt [10]. in Baghdad Alkarkh there is high fluctuation in the maternal mortality ratio from 2007 to 2018 the median of maternal mortality ratio for that period was 20.5 with range of 11/100000 - 42 /100000 live births, the year 2007 was lowest while the year 2018 reported the highest maternal mortality ratio [11].

The aim: To determine the causes and characteristics of maternal deaths in health directorate of Baghdad Al-karkh in 2018.

Methodology

Design: retrospective file based study that review all maternal deaths in health directorate of Baghdad Al-karkh in the 2018.

Duration: March and Aprils in 2019

Setting: The governmental hospitals are (Al-Yarmouk, Al-Imamin Kadhimin Medical City, Abu Ghraib, Tarmiyah, Al-Furat, Mahmudiyah, Karama, Karkh maternity and AL-Hakeem) are belong health directorate of Baghdad Alkarkh and the private hospitals are (Red crescent, AL- Shaffa, AL-salama, AL- harthya, AL-dahwy, AL- zehoor, AL-jamya, AL-kadymia private, AL- therkam, AL- keema, AL- Zahra, AL-masara and AL-karkh) all have delivery rooms and newborns care units.

Data source

1- Data related to death women (Death certificate, hospital medical record and antenatal care record) was obtained

from the governmental and private hospitals included in this study.

2- Data related to number of live births was obtained from the department of Planning /section of Health and Vital Statistic in Bagdad AL-karkh directorate [11].

Sample size: All maternal deaths that occurred during pregnancy, delivery, and 42 days after birth were included.

Maternal mortality files data processing: In Iraq the process of registering and reviewing the maternal deaths pass in three stages are:

- **At hospital:** once the maternal death happened should be notified early as possible within 24 hours to:
 - 1- Hospital authorities.
 - 2- Manager of maternal child unit at directorate of health in order to achieve meeting of "Maternal mortality committee" at hospital to discuss the events, identify the defects or the main cause which lead to death to avoided it in future. In a special form (questionnaire) contains demographic and personal data about the deceased woman and information on her obstetric history, antenatal care, history of last pregnancy, in addition to questions about place of delivery, history and complications that occurred during delivery, referral, transportation, as well as on the direct cause of death and predisposing factors. Information is to be taken from interviews with parents, health providers of care during delivery and the postpartum period.

- **At directorate of health**
Maternal death surveillance and response in the directorate of health Committee reviewed and assesses each individual case and conclusions in relation to the condition of the woman during pregnancy, delivery and postpartum. Information was also reviewed on case management in the hospital when the complications occurred and comparisons were made between symptoms, diagnosis and treatment (whenever such information was available and according to the information contained in the questionnaire). At the end of each review, the Committee gave a general assessment as to whether it was possible to prevent the death of the woman or not, to take action and then a detailed report with a copy of case sheet, death certificates and notes of attending obstetrician will be send to the Ministry of health.

- **At ministry of health**
Each maternal death is discussed by the national committee to identify what can be done more to prevent future similar conditions and to reduce maternal death. Then a feedback should be send to the directorate to take action [12].

Results

Table 1: Baghdad AL-Karkh total live births, No. and ratio of maternal mortality by the hospitals and home in 2018.

No.	Hospitals	No. of maternal death	No. live births	MMR/100000 live birth
Governmental hospitals	AL- Tarmiyah	1	399	251
	Al-Yarmouk	13	11079	117
	Al-Imamin Kadhimin Medical City	7	11392	61
	AL- Mahmudiyah	1	2668	37
	AL- Shaheed AL- hakeem	2	5832	34
	AL- Abu Ghraib	1	6926	14

Private hospitals	AL- Karkh maternity	1	9889	10
	AL- Furat	0	2132	0
	AL- Karama	0	2336	0
	AL- Kadymia private	1	2185	46
	AL- Masara	1	2377	41
	Red Crescent hospital	0	8459	0
	AL- Shaffa	0	508	0
	AL- Salama	0	1592	0
	AL- Harthya	0	166	0
	AL-dahwy	0	380	0
	AL- zehoor	0	1580	0
	AL-Jamya	0	609	0
	AL- Therkam	0	689	0
	AL- Keema	0	3216	0
	AL- Zahra	0	335	0
	AL-karkh	0	1649	0
Homes	10	14246	53	
Total	38	90644	42	

Table (1) showed A total of (38) maternal deaths occurred among 90644 live births (L B) in 2018 making the maternal mortality ratio (MMR) 42/100,000 LB.

In governmental hospitals the lowest MMR of 10 /100,000 LB in Al karkh Maternity hospital and the highest MMR of

251/100000 LB in Tarmyia hospital.

In private hospitals the lowest MMR of 41/100000 LB in AL-Masara hospital, and the highest MMR of 46 /100000 LB in AL-Kadymia private hospital was. Finally at home the MMR of 53/100000 LB.

Table 2: Baghdad AL-Karkh Maternal Mortality, demographical characteristics in 2018

Characteristics	Variables	No.	%
Age	Less than 20 years	5	13
	20-24	6	16
	25- 29	8	21
	30 – 34	6	16
	35- 39	10	26
	40 – 45	3	8
Occupation	Unemployed (house wife)	36	94
	Employee	2	6
Mother's education	Read and write or elementary level	19	50
	Secondary level	17	45
	Diploma or bachelors	2	5
Residence	Urban	32	85
	Rural	6	15

Table (2) showed the age distribution of the maternal mortality revealed that (42%) of maternal death at age groups (30- 39 years) and lower percentage of maternal deaths was among age group (40-45) years (8%). (94%) of the maternal deaths were un employee. Another correlate factors of

maternal death was the educational level of the women. About (50%) of all maternal deaths occurred in women who were Read and write or elementary level. (45%) with secondary level of education. regarding of residence of MM were (85%) of them lived in urban places.

Tables 3: Baghdad AL-Karkh Maternal Mortality, Obstetrical variables in 2018

Characteristics	Variables	No.	%	
ANC	No ANC un booked	10	26	
	Booked	Privet	19	50
		PHCs	9	24
Attendant	Doctor	28	74	
	Trained midwife	8	21	
	Untrained midwife	2	5	
Place of delivery	Hospital	31	82	
	Home	7	18	
Types of delivery	Cesarean sections	21	55	
	Normal vaginal	13	34	
	Abortion	4	11	
Gravidity	Primgravida (null parity)	12	32	
	(2-4) (low multiparty)	15	39	
	5 and above (grand multipara)	11	29	
Pregnancy outcome Baby state	Live	22	58	
	Dead	14	37	
	Aborted	2	5	

Sex of baby	Male	22	58
	Female	13	34
	Aborted (unknown)	3	8
Mid-wife intervention	No	32	85
	Yes	6	15

The table (3) showed the other maternal mortality characteristic about the obstetrical variables. (74%) of all MM who were delivered in study hospitals received antenatal care (booked) either (50%) in private clinic and (24%) in PHCs and the maternal mortality ratio for this group and (26%) of them did not receive antenatal care (un booked), about (74%) of MM attendance doctors airing pregnancy.

Of the (38) MM who were delivered in study hospitals with (55%) had Cesarean sections, (34%) followed by spontaneous vaginal delivery Parity distribution (range 0–more than 5) the highest maternal death was recorded in the (2-4 multiparae) was (39%) then (29%) of MM in grand multiparae (more than 5). Fetal outcome (58%) of baby was male, (15%) of deliveries with Mid-wife intervention.

Table 4: Baghdad AL-Karkh Maternal Mortality, Distribution of causes of maternal deaths in 2018

Causes of pregnancy-related maternal deaths		No.	%
Direct obstetric	Hemorrhage (PPH)	14	37
	Amniotic fluid embolism	12	32
	Eclampsia-Preeclampsia	3	8
	Rupture uterus	2	5
	Total	31	82
Indirect obstetric	Malignancy (reproductive system and brain)	3	8
	pancreatitis	1	3
	Pulmonary diseases Pneumonia	1	3
	Hepatitis	1	3
	Blood incompatibly	1	3
	Total	7	18

Table (4) showed that (82%) of maternal deaths due to direct obstetrical causes the rest (18%) due to indirect obstetrical causes The four most common direct causes of MM were haemorrhage (37%), Amniotic fluid embolism (32%) Eclampsia-Preeclampsia (8%) the last one is Rupture uterus

was (5%). The leading indirect cause of MM was infection of different organs were (9%) second one is Malignancy (reproductive system and brain) was (8%) of maternal deaths.

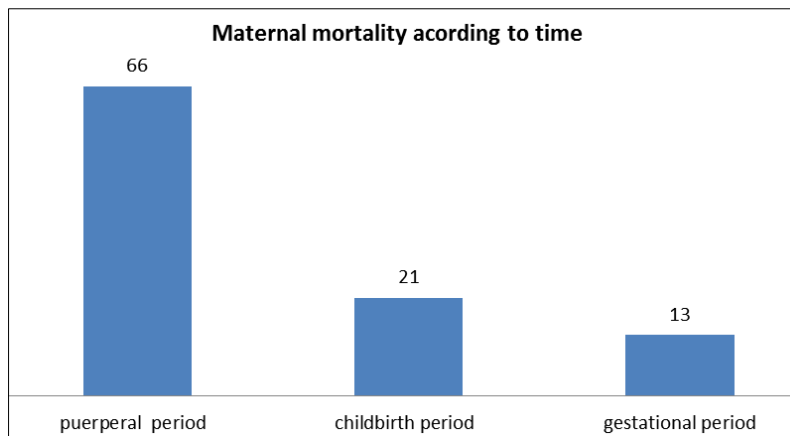


Fig 1: Baghdad AL-Karkh Maternal Mortality according to time in 2018

Fig 1: shown the maternal mortality according to the time. sixty-six percent of all maternal deaths occurred within puerperal period, then (21%) of MM during childbirth period, finally (13%) of MM during gestational period The implication of this is that many of the women came to seek care when their condition had already become grave.

Discussion

The maternal mortality ratio is the most important development indicator because it shows the status of each country’s development by taking into account the number of maternal deaths per 100,000 LB [13]. The MMR of current study was (42/100000 live birth) in 2018 which consider the highest MMR in Bagdad al Karkh in comparison with

previous year 2017 was (32/100000 live birth) [11] this can be explain due to the good surveillance system in the involved hospitals in this study and received the emergency pregnant mother when there is fully occupied hospitals outside of Baghdad Al-karkh. the MMR of this study Less than MMR of Karbala and Wasit (43.2/100000 and 43.5/100000 LB respectively), but higher than of MMR of Najef and Babil (25/100000 and 31/100000 LB respectively) [12] and higher than the baseline and national strategic target of MMR were 35.7/100000 LB and 33/100000 LB respectively [14]. This study revealed that most MM reported in age groups (30-39 years) was (42%) and the age group less than 20 years was (13%) this finding of such age groups (old and adolescent age) give poor outcomes in both mothers and their babies due

to high incidence of early marriage and obstructed labour or pelvic is not capable to carry a fetus as explain by the studies conducted by Iaoujah & et-al and study by Tadele and Abebaw^[15, 16] in other side the age group between (20 -29 years) was (37 %) this finding of such age group was an appropriate one for reproduction and pregnancy and considered non-risk group and may not experience problems during pregnancy, child birth and perperium period^[17], the study conducted by Enas Talib find that Mothers ≥ 35 years old showed higher rate of obstetric complication than young age group of mothers, while congenital anomalies were higher but not significant among young age group of mothers (≤ 30 years old)^[18]. Concerning women's education, this study revealed that (50%) of maternal mortality at the level of read and write or primary level this finding is in agreement with the studies of IAO Ujah & et-al^[15] and secondary educational level was (45%) but with bachelor level was (2%), this finding may affect on women health awareness & attitudes. More educated women closely associated with better or safe pregnancy, as verified by Arifeen study^[19] That raising the educational level of women of reproductive age is an important factor in reducing mortality and morbidity during pregnancy. In a study by Conde-Agudelo^[20] it was reported that the highest mortality rate occurred in mothers with only a primary education reproductive behaviors^[21].

With respect to women's occupation, the majority (94%) were Unemployed (house wife), there are multiple studies confirm that it is generally the work safe for a woman with an uncomplicated pregnancy to work without adverse effects for the woman, so time the pregnant need more precaution in some jobs e.g when exposed to teratogenic toxins, in jobs that have an increased risk of falls or injuries in other side Women with complicated pregnancies also may need work modifications to continue to work safely^[22]. American woman would work while pregnant increased dramatically through the 1960s and 1970s, and by the late 1980s, 67% of women pregnant with their first child remained on the job^[23].

Regarding the number of previous pregnancies (parity), (39%) of MM had 2-4 gravida this group was less risky than MM with more than 5 gravida was (29%) the risk is (1.5 -3) times for women with five than those with two or three children^[24]. the study conducted by Bai j and et-al showed that There is a significant association between different parity levels and pregnancy outcomes in terms of obstetric complications. the mothers of null parity and grand multiparae are at higher risk^[25].

In other side the Antenatal care during pregnancy, the majority of women (74%) of MM visited antenatal care in private clinics or primary health centers. This finding indicated that mother's awareness toward the importance of seeking antenatal care. Some studies reported that there is a difference in the pregnancy outcome between women who had regular & adequate antenatal care and those who had irregular antenatal care or had no at all^[26, 27]. In high-income countries, virtually all women have at least four antenatal care visits, are attended by a skilled health worker during childbirth and receive postpartum care. In low-income countries only 40% of all pregnant women had the recommended antenatal care visits in 2015 the cause due to poverty, inadequate services and cultural practices^[28].

Regarding the causes of deaths most of MM were due to direct obstetric causes (82%) the main cause was (37%) postpartum hemorrhage. in comparison with the study of Enas S. Al Kayt it was less than in this study^[29] The post partum

hemorrhage is one of the serious leading causes of maternal death & associated with poor outcome^[30] The study done in Saudi Arabia by Al-Suleiman fined that the leading cause of death was hemorrhage (75%)^[31]. In other side the second cause was (8%) of MM due to the experienced pregnancy induce hypertension (Eclampsia-Preeclampsia) which occurs in (2-10%) of pregnancies and it is associated with both maternal and neonatal morbidity and mortality^[32] what about the indirect obstetrical cause of MM represented (18%), the main cause was malignancy (breast, cervix, uterus, ovary, brain) was (3%) of all causes of MM when compared with the study of Triunfo S. that the estimated incidence of cancer diagnosed in pregnant women in developed societies is (1:1000) pregnancies^[33]. In other side the J. Raphael and et-al explained that the Pregnancy-associated malignancy a tends to be more aggressive and has a poor prognosis on women and fetus^[34]. In the current study, (82%) of the MM gave birth in hospitals while in Iran was (94%) of the mothers who died had given birth in a hospital^[35] And also In the current study, 18% of the mothers gave birth in home while (82.8%) of pregnant women who died were giving birth at home in Pakistan as mention in the study of Jokhio *et al.*^[36]

Regarding of the timing of maternal death (ante partum, intrapartum and postpartum mortality rates) in our study most MM occur during postpartum was (66%) this finding is mimic the WHO report revealed that greater than 60% of global maternal deaths occur during the postnatal period^[37]. in other side and the study of Leena Merdad found that maternal mortality rates varied by country and region, with some showing an orderly decline in all three periods and others exhibiting alarming increases in antepartum and postpartum mortality. Ecological analysis showed that antenatal care coverage was significantly associated with low ante partum mortality, whereas the presence of a skilled attendant at childbirth was significantly associated with low postpartum mortality^[38]. In other side the MM during postpartum in current study was higher than MM during postpartum in Jordan was 57%^[39].

Conclusion

Maternal mortality ratio in health directorate of Baghdad AL-Karkh in 2018 has remained high since ten years ago, main direct causes of MM is haemorrhage, while the indirect causes include infection of different organs of MM.

Factors Contributing to MM in this study was maternal age, educational level, multiparty, mode and place of delivery and midwife interventions and the highest risk of dying was during puerperal period.

Recommendations

1. A region-specific programs should be developed. These programs should take into consideration the social, cultural and religious believes, with appropriate communication messages, to increase the awareness of families about the contributing factors lead to MM, encourage them about pregnancy spacing and improve family planning services in the community.
2. Improve the quality of the health care which provided to women in the labor rooms to reduce unexpected complications during childbirth period.

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