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Study of Cardiac Maternal Mortality in Iraq

Dr. Thaer Jabbar AL-Zaidy[1], Dr. Zeyad Kareem Kadhim[2] and Dr. Ayad Hameed Tailan[3]

[1]M.B.Ch.B. \ C.A.B.M.S. \ M.D. \ (Medicine), Iraqi Ministry of Health, Thi-Qar Health Office, Al-Nasiryah Teaching Hospital, Thi-Qar, Iraq

[2]M.B.Ch.B. \ F.I.B.M.S. \ (Anasthesia), Iraqi Ministry of Health, Baghdad Health Directorate - Al-karkh, Higher Health Institute - Al-Kadhimiya, Baghdad, Iraq

[3]M.B.Ch.B. \ C.A.B.M.S. (Nephro) & C.A.B.M.S. \ (Medicine), Iraqi Ministry of Health, Thi-Qar Health Office, Al-Nasiryah Teaching Hospital, Thi-Qar, Iraq

Abstract: Background: The postpartum phase begins immediately after the child's delivery and typically lasts six to eight weeks, ending when the mother's body is nearly back to its pre-pregnancy form**.** The weeks following childbirth create the groundwork for both the woman's and her baby's long-term health and well-being. **Objective:** This paper aims to study of cardiac maternal mortality patients in Iraq. **Patients and Methods**: Data were collected retrospectively through reviews of electronic medical records or electronic hospital records, and discharge data for all cardiac maternal mortality patients from different hospitals in Iraq between 4th July 2021 to 7th January 2022, who were >25 years of age or older. These data were designed with two groups where the first group was represented with cardiac maternal mortality patients that explain women patients who have cardiac maternal and struggled during while the second group was represented control group explain the patients' group who could treated of it. A statistical study was conducted for cardiac maternal mortality patients using the SPSS program. **Results and Discussions:** Several studies in England and the Netherlands and Germany revealed an increase in maternal mortality owing to cardiovascular illness during the last decade. Severe morbidity from cardiovascular illnesses is expected to rise as well. This corresponds to cardiac risk factors such as higher mother age and obesity in the overall Dutch population. Cardiovascular problems occurred in 11% of pregnancies in women with different forms of CHD. As well as Comorbidities, it got results highest diabetes type 2 was found in 24 (33.33%) for the cardiac maternal mortality patients' group and 18 (32.14%) for the control patients' group with a p-value of 0.0496. Furthermore, this study described the disadvantages of cardiac were discovered that Hypokinetic cardiomyopathy got 26 (36.11%) and heart failure 11 (15.28%). Besides to that, this study is evaluated maternal mortality outcomes according to cardiac events where hypokinetic cardiomyopathy found a number of cardiac maternal mortality (5) with 6.94%. **Conclusion:** Cardiovascular disease is a rare cause of severe maternal morbidity with a high mortality rate. Previous studies in England have shown that most heart disorders develop during pregnancy, childbirth, or the puerperium in women without pre-existing heart disease. In 13% of cases, a serious adverse event from medication may have a critical role in the development of complications. This study found that maternal mortality outcomes according to cardiac events where hypokinetic cardiomyopathy found a number of cardiac maternal mortality (5) with 6.94%.

Keywords: Cardiovascular disease; Comorbidities; ASA; parity 1–2; and Singleton pregnancy.

INTRODUCTION

The postpartum phase begins immediately after the child's delivery and typically lasts six to eight weeks, ending when the mother's body is back to its pre-pregnancy form [Arafeh, J.M. *et al*., 2006]. The weeks following childbirth create the groundwork for both the woman's and her baby's long-term health and well-being [Lewis, G, 2007]. As a result, defining a trustworthy postpartum (postpartum) term that should be dedicated to continuous, ongoing, and comprehensive treatment is critical. The majority of maternal and newborn fatalities occur within the first month of life [Bedard, E. *et al*., 2008; Curry, R. *et al*., 2009]. As a result, proper postpartum care is required to enhance the mother's and newborn's short- and long-term health outcomes [Schutte, J.M. *et al*., 2010]. In wealthy nations, heart disease is still the largest cause of maternal morbidity and death, and it has been on the rise in recent decades. Cardiomyopathy and other cardiac diseases were responsible for 26.7% of pregnancy-related fatalities between 2011 and 2018, according to statistics from the Centers for Disease Control and Prevention [Sliwa, K. *et al*., 2010]. However, the rise in maternal mortality is related in part to the increased prevalence of heart disease in women giving birth, which increased by 24%, and complications in such pregnancies increased by 18% in the last decade as heart conditions in pregnancy, such as OCD, were cardiomyopathy, which accounted for an 18% rise, as well as pulmonary hypertension (PH) [LVR, 2011]. Furthermore, heart failure (HF) has been identified as the underlying cause of more than 9% of in-hospital mortality among pregnancy-related hospitalizations, with the prevalence of HF diagnosed during pregnancy rising from 2001 to 2018, raising concerns [NVOG, 2011]. Importantly, HF remains the most prevalent significant cardiovascular complication to emerge

***Corresponding Author:** Dr. Thaer Jabbar AL-Zaidy

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during pregnancy among expecting mothers with pre-existing heart disease of any sort, whether owing to cardiomyopathy or congenital heart disease, complicating 11% of such pregnancies. High-risk pregnancies increased dramatically from 0.7% in 2007 to 2014 to 10.9% in 2015 to 2018, as more women with pre-existing medical issues, such as heart disease, chose parenthood [Regitz-Zagrosek, V. *et al*., 2011; Roos-Hesselink, J.W. *et al*., 2012]. Although, maternal health can affect the well-being of both mothers and their babies. In a young population whose health can dramatically change the course of their lives, mothers who develop hepatitis C are at increased risk of death and a variety of adverse cardiac and obstetric outcomes [Balci, A. *et al*., 2011]. In addition, recent findings are already beginning to show that the risk to newborns is significant, including increased perinatal mortality, premature birth, lower Apgar scores, and prolonged stay in the neonatal intensive care unit [Fornet, I. *et al*., 2006]. Specific guidelines create opportunities to reduce the likelihood of adverse outcomes in this population [Chapelle, C.F. *et al*., 2012; Donati, S. *et al*., 2018]. The majority of HF diagnoses are made in the postpartum period, with a significant number of cases occurring as late as weeks after delivery, and the chance of death occurring 4 weeks postpartum was higher for women undergoing cardiovascular than non-cardiovascular deaths than emphasizes the importance of accessing follow-up care and insurance coverage for mothers after 3 to 6 weeks that may or may not be available through most public options. Because many women lose health coverage at this point, they are left vulnerable [Knight, M. *et al*., 2020]. A variety of sociodemographic and medical factors contribute to a woman's risk of developing HF during pregnancy, and therefore we can use our understanding of these elements to provide better care for this deserving group of patients [Nyfløt, L.T. *et al*., 2021]. This paper aims to study of cardiac maternal mortality in Iraq.

PATIENTS AND METHODS

Data were collected retrospectively through reviews of electronic medical records or electronic hospital records, and discharge data for all cardiac maternal mortality patients from different hospitals in Iraq between 4th July 2021 to 7th January 2022, who were >25 years of age or older. These data were designed with two groups where the first group was represented with cardiac maternal mortality patients that explain women patients who have cardiac maternal and struggled during while the second group was represented control group explain the patients' group who could treated of it. A statistical study was conducted for cardiac maternal mortality patients using the SPSS program. Data were collected different hospitals in Iraq for patients in general, where the groups were divided into two groups, one of which represented a group of cardiac maternal mortality patients, which recruited 72 patients, while the second group was Control patients, which recruited 56 patients, where the comprehensive information for patients was distributed in the demographic data, and it included age, which ranges between 25-36 years, BMI, one of which is 28-30 and the other 31-34, comorbidities, which consist of diabetes type 1, diabetes type 2, hypertension, other diseases, positive family of heart diseases, which are determined by yes or no, and smoking , and the ASA factor, which included I, II, and III, as shown in **Table 1**. as shown in **Table 2** distribution of cardiac maternal mortality patients and control patients based on obstetric history and mode of delivery where data included obstetric history consisting of prior caesarean section, parity 0, parity 1–2, parity >3, current pregnancy consisting of singleton pregnancy, multiple pregnancy , artificial reproduction techniques: IVF/ICSI, delivery which included spontaneous delivery, ventouse/forceps delivery, induction of labor, pre-labor caesarean section, caesarean section overall, breech presentation, preterm birth (<37 w), post term birth (≥ 42 w), and ICU or CCU admission. Besides that, this study described as well as disadvantages of cardiac Myocardial infarction, hypokinetic cardiomyopathy, wide complex tachycardia, and heart failure can be seen in **Table 3**. Also, this study Evaluated of maternal mortality outcomes according to cardiac events Myocardial infarction, Hypokinetic cardiomyopathy, Wide complex tachycardia, and Heart failure as shown in **Table 4.** This study have discussed in compared with previous studies was found within cardiac maternal mortality of 72 patients was 32 (44.44%) for ages 29-32 years while 24 (42.86%) for ages 33-36 years.

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RESULTS

Table 1: The demographic results of cardiac maternal mortality patients and control patients

Items	Cardiac Maternal Mortality Patients (N=72)	Control Patients (N=56)	P-value
Age			
25-28	12 (16.67%)	10 (17.86%)	0.0488
29-32	32 (44.44%)	22 (39.29%)	0.0465
33-36	28 (38.89%)	24 (42.86%)	0.0472
BMI			
28-30	42 (58.33%)	31 (55.36%)	0.04772
31-34	30 (41.67%)	25 (44.64%)	0.0478
Comorbidities			
Diabetes Type 1	17 (23.61%)	13 (23.21%)	0.04985
Diabetes Type 2	24 (33.33%)	18 (32.14%)	0.0496
Hypertension	20 (27.78%)	16 (28.57%)	0.0497
Other diseases	11 (15.28%)	9 (16.07%)	0.0494
Positive family of heart diseases			
Yes	8 (11.11%)	5 (8.93%)	0.0473
No	64 (88.89%)	51 (91.07%)	0.0468
Smoking			
Yes	5 (6.94%)	3 (5.36%)	0.0493
No	67 (93.06%)	53 (94.64%)	0.0495
ASA			
I	18 (25%)	11 (19.64%)	0.0455
II	23 (31.94%)	16 (28.57%)	0.0476
III	31 (43.06%)	29 (51.79%)	0.0377

Table 2: Distribution of cardiac maternal mortality patients and control patients based on obstetric history and mode of delivery

Items	Cardiac Maternal Mortality Patients (N=72)	Control patients (N=56)	P-value
Obstetric history			
prior caesarean section	15 (20.83)	8 (14.29%)	0.0447
parity 0	12 (16.67%)	14 (25%)	0.0362
parity 1–2	27 (37.5%)	16 (28.57%)	0.0332
parity >3	18 (25%)	18 (32.14%)	0.0386
Current pregnancy			
singleton pregnancy	33 (45.83%)	28 (50%)	0.0455
multiple pregnancies	23 (31.94%)	17 (30.36%)	0.0483
artificial reproduction techniques: IVF/ICSI	16 (22.22%)	11 (19.64%)	0.0368
Delivery			
spontaneous delivery	8 (11.11%)	2 (3.57%)	0.0348
ventouse/forceps delivery	5 (6.94%)	4 (7.14%)	0.0489
induction of labour	11 (15.28%)	7 (12.5%)	0.0468
pre-labour caesarean section	4 (5.56%)	4 (7.14%)	0.0482
caesarean section overall	16 (22.22%)	11 (19.64%)	0.0472
breech presentation	14 (19.44%)	8 (14.29%)	0.0433
preterm birth (<37 w)	5 (6.94%)	2 (3.57%)	0.0475
post-term birth (≥42 w)	3 (4.17%)	6 (10.71%)	0.0452

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ICU or CCU admission	6 (8.33%)	12 (21.43%)	0.0335

Table 3: Describe of disadvantages cardiac.

Items	cardiac maternal mortality patients (N=72)
Myocardial infarction	14 (19.44%)
Hypokinetic cardiomyopathy	26 (36.11%)
Wide complex tachycardia	21 (29.17%)
Heart failure	11 (15.28%)

Table 4: Evaluation of maternal mortality outcomes according to cardiac events

Items	Number of cardiac maternal mortality (N=72)	Percentage (%)
Myocardial infarction	2	2.78%
Hypokinetic cardiomyopathy	5	6.94%
Wide complex tachycardia	3	4.17%
Heart failure	2	2.78%

Table 5: Multivariate logistic regression analysis of pneumothorax risk factors

Risk factor	Regression coefficient	Standard error	P value	OR	95% CI of OR	
					Lower	Upper
Age	0.015	0.008	0.101	1.1	0.8	1.4
Hypokinetic cardiomyopathy	1.1	0.02	0.0023	3.657	2.44	6.3
prior caesarean section	−1.408	0.213	0.044	0.5	0.33	0.898
Anaesthesia	−0.07	0.0058	0.033	0.992	0.981	1.004
BMI	0.645	0.149	0.000	1.83	1.34	3.3
Positive family of heart diseases	0.422	0.073	0.001	1.23	0.88	1.666

DISCUSSIONS

This study have discussed in compared with previous studies were found within cardiac maternal mortality of 72 patients was 32 (44.44%) for ages 29-32 years while 24 (42.86%) for ages 33-36 years also, BMI read of 28-30 and 31-34 were (42 (58.33%) for cardiac maternal mortality patients' group and 31 (55.36%) Control patients with P-value 0.04772) while were (30 (41.67%)) for cardiac maternal mortality patients' group and (25 (44.64%)) Control patients with P-value 0.0478. As well as Comorbidities, it got results highest diabetes type 2 was found in 24 (33.33%) for the cardiac maternal mortality patients' group and 18 (32.14%) for the control patients' group with a p-value of 0.0496. Positive family of heart diseases had within two types of assessment and got No the highest score of evaluation 64 (88.89%) for cardiac maternal mortality patients' group 51 (91.07%) for Control patients' group with p-value 0.0468, and according to smoking evaluation, the results 67 (93.06%) for cardiac maternal mortality patients' group and 53 (94.64%) for control patients' group with p-value 0.0495. In addition, ASA was distributed with three types of classified and was found highest resulted of patients in 31 (43.06%) or cardiac maternal mortality patients' group 29 (51.79%) for the control patients' group with a p-value of 0.0377. [Slomski, A, 2019]

Based on the Obstetric history, this study focused on the obstetric history and mode of delivery where parity 1–2 was found the most for cardiac maternal mortality patients 27 (37.5%) and 18 (32.14%) for parity >3 of control patients and as well as this data have found current pregnancy of singleton pregnancy where 33 (45.83%) for cardiac maternal mortality patients and 28 (50%) for control patients with p-value 0.0455, also, these results found that caesarean section overall of cardiac maternal mortality patients 16 (22.22%) and Control patients 11 (19.64%) with p-value 0.0472. Furthermore, this study described the disadvantages of cardiac were discovered that Hypokinetic cardiomyopathy got 26 (36.11%) and heart failure 11 (15.28%). Besides to that, this study is evaluated maternal mortality outcomes according to cardiac events where hypokinetic cardiomyopathy found a number of cardiac maternal mortality (5) with 6.94%.

Several studies in England and the Netherlands and Germany revealed an increase in maternal mortality owing to cardiovascular illness during the last decade [Regitz-Zagrosek, V. *et al*., 2018].

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Severe morbidity from cardiovascular illnesses is expected to rise as well [CBS, 2007]. This corresponds to cardiac risk factors such as higher mother age and obesity in the overall Dutch population [Drenthen, W. *et al*., 2007]. Another limiting aspect may be the fact that more women with CHD are reaching reproductive age due to breakthroughs in treatment. Cardiovascular problems occurred in 11% of pregnancies in women with different forms of CHD. [Bonneux, L. *et al*., 2008; Brace, V. *et al*., 2004]

CONCLUSIONS

Cardiovascular disease is a rare cause of severe maternal morbidity with a high mortality rate. Previous studies in England have shown that most heart disorders develop during pregnancy, childbirth, or the puerperium in women without pre-existing heart disease. In 13% of cases, a serious adverse event from medication may have a critical role in the development of complications. This study found that maternal mortality outcomes according to cardiac events where hypokinetic cardiomyopathy found a number of cardiac maternal mortality (5) with 6.94%.

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