International Journal of Science and Research (IJSR)
ISSN: 2319-7064
ResearchGate Impact Factor (2018): 0.28 | SJIF (2019): 7.583

Maternal Mortality and Morbidity Caused by Puerperal Sepsis at Omdurman Maternity Hospital (OMH), Sudan 2017

Kuna A[1], Elhussein OG[2], Salah Ismail[3], Khadiga Abdallah[4], Suaad Elnour[5], Murwan I Omer[3], Sahar A Alfaki[4], Umbeli T [5]

[1] MD, Associate Professor, Department of OBGYN, University of Bahri, Sudan

[2, 3, 4, 5] MD, Associate Professor, Department of OBGYN, OIU

[6]MRCOG, Consultant Obstetrician and Gynecologist, Director General, OMH

[7]MBBS, Resident Registrar, OBGYN, OMH

[8]Professor, MD. FCM. PhD, Department of OBGYN and Community Medicine, Faculty of Medicine, Omdurman Islamic university (OIU)

Abstract: ***Background: Puerperal sepsis is a life threatening condition triggered by infection. It is a common cause of maternal mortality and morbidity and the third direct cause of maternal death in Sudan. Objectives: To study maternal mortality and morbidity from puerperal sepsis and to indentify its associated risk factors at Omdurman maternity hospital (OMH) 2017. Methodology: This is a descriptive observational, cohort, hospital based study, conducted at (OMH), during 2017. All women who delivered or admitted to OMH during puerperium and diagnosed as puerperal sepsis were included in the study after an informed consent. Data was collected by trained data collectors using a structured format. Included variables were; detailed history and examination, socio- demographic characteristics, obstetric profile, management received, admission to intensive care unit (ICU) and maternal mortality and morbidity. Data was analyzed using SPSS version 21. Results: During the study period, a total of 36204 deliveries were reported, 25813 (71.3%) were vaginal deliveries and 10391 (28.7%) were cesarean section (C/S). Out of them, 133 were diagnosed as puerperal sepsis, 60 (45.1%) delivered vaginally and 73 (54.9%) by C/S. Rate of puerperal sepsis in this hospital was 0.37%, o.23% for vaginal delivery and 0.7% for C/S. Common risk factors were; repeated vaginal examination 35 (26.3%), prolonged labour 30 (22.6%) and prolonged rupture of membranes 23 (17.3%). Frequently associated with middle age (21-30 years) 71 (53.4%), multiparity 61 (45.9%), illiteracy 48 (36.1%) and rural residence 81 (60.9%). Mostly presented with; fever 77 (57.9%), foul smelly vaginal discharge 31(23.3%) and abdominal pain 12 (09.0%). Thirty six (42.4%) developed septicemia, 28 (21.0%) were admitted to intensive care unit (ICU) and nine died, with fatality rate of 6.8%. Conclusion: Puerperal sepsis is a common preventable public health problem, with high maternal mortality. Main risk factors are related to childbirth and interventions during labour, where optimal antiseptic measures are needed throughout the process of labour. Low rate in this hospital may be due to strict efforts for infection prevention.***

Keywords: puerperal sepsis, vaginal delivery, caesarean section, Sudan

1. Introduction

Puerperal sepsis is a major cause of maternal morbidity and mortality, where early identification and prompt treatment should be given immediately following the diagnosis [(1).] It was defined by the WHO; as a life threatening condition with organ dysfunction resulting from infection during pregnancy, child birth or puerperium [(2).] It is a preventable health problem causing maternal mortality and morbidity in both developed and developing countries [(3).] It is the third cause of direct maternal mortality in developing countries as well as in Sudan [(4,5).] It may be a result of chorioamnionitis, endometritis (with or without retained products of conception), wound or C/S infection, perineal tear or lactational mastitis. Usually presents with fever, foul smelly vaginal discharge, pelvic pain and sub involution of the uterus. .

Sepsis should be suspected when infection is accompanied by two or more of the systemic inflammatory response syndrome (SIRS) criteria [(6).] SIRS criteria include; fever, (temperature of 38.3 degree centigrade), or hypothermia (temperature of less than 36 degrees), tachycardia (pulse rate is more than 90 pbm), tachypnea (respiratory rate more than 20 per minute) and WBC is more than 20 or less than 4 thousands [(6).] This may be associated with or without rigors, acutely altered state, hypotension or hypoglycemia. When the condition is associated with organ dysfunction or poor tissue perfusion, it is called severe sepsis. However, when hypotension failed to respond to fluid therapy the condition is called septic shock [(6).]

It is related to poor hygiene during delivery and postpartum. Its common risk factors include; home delivery, prolonged rupture of membranes, repeated vaginal examinations, prolonged labour, instrumental delivery, post partum haemorrhage (PPH), multiparity, cesarean section (C/S), low socio-economic conditions, poor nutrition, overweight, or obesity. Common source of infection could be exogenous from external contamination or endogenous from organisms colonizing female genital tract. It is complicated by sepsis, endotoxic shock, peritonitis, abscess formation and poor obstetric future. It can be prevented by; hand washing, prophylactic antibiotics and good post delivery hygiene. However, early detection, accurate diagnosis and optimal treatment strategies are essential to improve outcomes and

prevent mortality and morbidity. According to our knowledge; no accurate data on puerperal sepsis in this hospital or in the country, as many causes can go underreported or undiagnosed, which necessitates the need for this study.

2. Material and Methods

This is a prospective cross-sectional, cohort hospital based study conducted at Omdurman maternity hospital (OMH) during 2017. OMH is the main referral maternity hospital in Sudan for both public and private hospitals with all facilities to provide 24 hours comprehensive emergency obstetric and gynecological care. All women who delivered or admitted during puerperium and diagnosed as puerperal sepsis were included in the study after an informed consent. Data was collected by trained data collectors using a structured format. Included variables were; detailed history and examination, socio- demographic characteristics, obstetric profile (parity, place of birth, duration of labour, birth attendant, mode of delivery and duration of rupture of membranes), management received, admission to intensive care unit (ICU) and maternal mortality and morbidity

Cases were identified on daily basis by principal investigators with the assistance of two trained resident registrars for data collection, by attending daily morning meeting reports, visits to labour ward, ICU, operating rooms and postnatal wards, using a structured data abstraction form. Care providers involved in the management of reported cases were questioned in case of missing information from patient records. An ethical clearance was obtained from ethical review committee (ERC) at OMH and an informed consent was obtained from all cases diagnosed as puerperal sepsis, data was analyzed using SPSS version 21.

3. Results

During the study period, a total of 36204 deliveries were reported, 25813 (71.3%) were vaginal deliveries and 10391 (28.7%) were cesarean section (C/S). Out of them, 133 cases were diagnosed as puerperal sepsis, 60 (45.1%) delivered vaginally and 73 (54.9%) delivered by C/S. Rate of puerperal sepsis in this hospital was 0.37%, while it was o.23% for vaginal delivery and 0.7% for C/S. Twenty eight (21.0%) admitted to intensive care unit (ICU) and nine died, with fatality rate of 6.8%. Commonly affects; middle age women, 21-30 years, 71(53.4%), multiparous 61(45.9%), rural residence 81(60.9%) and illiterate 48(36.1%). The main frequent clinical features were; fever, 77 (57%) and smelly vaginal discharge 31 (23.3%), while commonest morbidity was septicemia, 36 (17.3%). The main risk factors were; repeated vaginal examination 35(26.2%), prolonged labour 30(22.6%), and prolonged rupture of membranes 23(17.3%).

4. Discussion

Puerperal sepsis is one of the leading causes of preventable maternal morbidity and mortality. Generally, the rates of puerperal sepsis vary between (1-17%) with wide variations between developing and developed countries [7]. This is due to variation in local conditions including; hygiene during delivery, presence of pelvic inflammatory diseases (PID), and associated aetiology and epidemiology of sepsis [8]. In this hospital study, the overall rate of puerperal sepsis was 0.37%, o.23% for vaginal delivery and 0.7% for C/S. This rate is very low compared to a teaching hospital in Gadarif state, eastern Sudan where the rate of puerperal sepsis was found to be 12.0% [9]. It is lower than many developing countries and even less than the global rate of 4.4%, or that reported in Pakistan; 10-15% and USA, 1-8% [8, 10, and 11]. Although this is a hospital based record rather than country level as in USA or Pakistan, where many cases of puerperal sepsis may occur at home and can go unreported. The hospital receives referred cases from different hospitals in Khartoum and other states, where patients present too late in terminal conditions that increased the maternal mortality from sepsis to 6.8%. OMH is a tertiary maternity hospital with good facilities for infection prevention and strict measures were adopted for implementing infection prevention protocols and management of septicemia with facilities for intensive care and mechanical ventilation.

Maternal mortality from sepsis in this study is less than the national maternal mortality, 12.3%, reported from maternal death surveillance and response (MDSR) [12]. However it is similar to that reported in Pakistan 8.5% and that reported by WHO 2006, 9.7% from Africa [13,14]. Sepsis is still a highly killing condition even its rate is not so high. As seen in this study; rural residence, home delivery, low socio-economic status and poor hygiene may contribute to high puerperal sepsis. Young illiterate primigravidae living in rural areas tend to deliver at home by traditional birth attendants (TBA) or trained village midwives under poor healthy conditions, where they take a long course of labour in various hands before reaching the hospital, resulting in puerperal sepsis. This may result in severe septicemia or even septic shock with poor maternal outcome and high maternal mortality.

The most frequent associated risk factors of puerperal sepsis were repeated vaginal examination 26.3%, prolonged labour 22.6%, prolonged rupture of membrane 17.3%) and delivery by C/S 54.9%. This is consistent with that found in Pakistan 2013, where the commonest risk factors were; prolonged labour, prolonged rupture of membranes, suboptimal personal hygiene and improper sterilization [13]. It is also similar to that found in Egypt where sepsis was associated with; low socio-economic status, frequent vaginal examination in public hospitals and unhygienic postnatal conditions [15]. Mode of delivery by itself does affect the rate of puerperal sepsis, but conditions predispose to C/S contribute to the basis of puerperal sepsis particularly when labour started at home and patients stayed for a long time subjected to repeated vaginal examination under unhygienic conditions. However, the growing evidence suggests that, the single most important risk factor for post partum infection is C/S [15]. it is clear that during C/S there is more tissue exposure and manipulation which can lead to more infection, particularly when C/S is due to obstructed labour, prolonged rupture of membranes or multiple vaginal examinations before C/S.

5. Conclusion

Puerperal sepsis is a common preventable public health problem, with high maternal mortality. Main risk factors are related to childbirth and interventions during labour, where optimal antiseptic measures and careful monitoring are needed throughout the process of labour. Low rate in this hospital may be due to strict efforts for infection.

6. Acknowledgement

Authors would like to thank director general of Omdurman maternity hospital, data collectors all clients who participated in this study.

7. Conflict of Interest

Authors declare that they have no conflict of interest in this study.

References

[1] Shamshad, Saadia Shamsher, Bushara Rauf. Puerperal sepsis- still a major threat for parturient. J Ayub Med Coll Abbottabad 2010; 22(3): 18-22.
[2] WHO, Road map for accelerating the attainment of millennium Developmental Goals related to maternal and newborn health Africa, Health systems and disaster preparedness and response, 2004; 18: 29-31.
[3] Maharaj D. Puerperal pyrexia: a review part II. Obstet Gynecol Surv 2007; 62: 400–6.
[4] Getu Alemu Demisse, Samuel Dessau Sifer, Buseraseman Kedir, Daniel Belema Fekene and Gizachew Abdissa Bulto. Determinants of puerperal sepsis among post partum women at public hospitals in west SHOA zone Oromia regional state, Ethiopia (institution based case control study). BMC Pregnancy and Childbirth (2019) 19:95
[5] Umbeli T, Eltahir S, Seham A Habeeb Allah, Nuha A Saliheen, Kunna A, Mohamed S Ahmed and Mirghani SM. Achievements and challenges of implementing maternal death review (MDR) in Sudan; 2010 – 2015. *International Journal of Current research*, 2017; Vol. 9, Issue, 01:45139- 45143.
[6] Acosta CD, Kurinczuk JJ, Lucas DN, Tuffnell DJ, Sellers S, Knight M. Severe Maternal Sepsis in the UK, 2011±2012: A National Case-Control Study. PLoS Med. 2014; 11(7):2011-2.
[7] Glanzer CM, MacArthur C. Post natal morbidity. Obstet Gynaecol 2001;3(4):179–83.
[8] Carla Abou Zahr. Global burden of maternal death and disability. `British medical Bulletin 2003;67(1):1–11.
[9] Ahmed MI, Alsammani MA, Babiker RA. Puerperal sepsis in a rural hospital in Sudan. Mater Sociomed. 2013; 25(1): 19–22.
[10] Faiza I. Maternal Mortality. In the Review Dawn News Paper Karachi Pakistan, 25th–31st Jan 2007. P. 5.
[11] Carter, KC, Barbara R. Carter. Childbed fever. A scientific biography of Ignaz Semmelweis. Transaction Publishers; 2005. p.100.
[12] Umbeli T[1*], Seham A Habeeb Allah[2], Nuha A Saliheen[2], Manal H Taha[2], Kunna A[3] and Mohamed S Ahmed[4] and Awatif J Al Bahar [5]. Implementing Maternal Death Surveillance and Response (MDSR) in Sudan 2014-2017: Achievements and challenges. International journal of current research, September 2018; vol 10, issue 09: 73136-9.
[13] Khaskheli M, Baloch S, Sheeba A. Risk factors and complications of puerperal sepsis at a tertiary healthcare centre. Pak J Med Sci. 2013 Jul-Aug; 29(4): 972–976.
[14] Khan KS, Wojdyla D, Say L, Gülmezoglu AM, Van Look PF. WHO analysis of causes of maternal death: a systematic review. Lancet. 2006;367:1066–74.
[15] Dare FO, Bako AU, Ezechi OC. Puerperal sepsis: a preventable postpartum complication. Tropical Doctor 1998; 28:92-95.

Table 1: Characteristics of patients diagnosed as puerperal sepsis at Omdurman maternity hospital 2017.

Characteristics	No (133)	%
Age		
< 20 years	25	18.80%
21-30 years	71	53.40%
31-40 years	37	27.80%
Parity		
Primigravida	45	33.80%
Multiparous	61	45.90%
Grandmultipara	27	20.30%
Residence		
Rural	81	60.90%
Urban	52	39.10%
Education		
Illiterate	48	36.10%
Primary school	37	27.80%
Secondary school	27	20.30%
University	21	15.80%

Table 2: Symptoms and signs of patients diagnosed as puerperal sepsis at Omdurman maternity hospital 2017.

Characteristics	No (133)	%
Symptoms and signs:		
Fever (temp. > 38 C)	77	57.90%
Foul smell vaginal discharge	31	23.30%
Lower abdominal pain (tender uterus)	12	9.00%
Diarrhea and vomiting	7	5.30%
Shock	6	4.50%
Total	133	100.00%

Table 3: Associated risk factors in patients diagnosed as puerperal sepsis at Omdurman maternity hospital 2017.

Associated risk factors	No (133)	%
Repeated vaginal examinations	035	26.3%
Prolonged labour	030	22.6%
Prolonged rupture if membranes	023	17.3%
Extended episiotomy or perneal tears	020	15.0%
Severe anemia	010	07.5%
Total	133	100.0%

Table 4: Maternal morbidity associated with puerperal sepsis in patients at Omdurman maternity hospital 2017.

Associated morbidity	No (85)	%
Septicemia	036	42.4%
Pelvic peritonitis	015	17.6%
Pelvic abscess	013	15.3%
Endotoxic shock	008	09.4%
Deep vein thrombosis (DVT)	007	08.2%
Renal failure	006	07.1%
Total	085	100.0%