ORIGINAL ARTICLE

PUERPERAL SEPSIS —STILL A MAJOR THREAT FOR PARTURIENT

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Background: Puerperal sepsis is one of the leading causes of preventable maternal morbidity and mortality. It is still ranked as 3rd major cause of maternal deaths in our country. The objective of this study was to evaluate morbidity and mortality from puerperal sepsis and to identify its risk factors. **Methods:** This observational study was carried out in Ayub Teaching Hospital over a period of three years. All patients admitted with diagnosis of puerperal sepsis secondary to genital tract infection were evaluated with thorough details of history and examination to determine their demographic details, obstetrical profiles, presenting features, state of infectious morbidity, need for intervention and mortality related to puerperal sepsis. **Results:** Puerperal sepsis was 1.7% of all obstetrical admissions and 34.4% of postnatal complications. It was seen common among young patients of 15–25 years age, 61 (66.3%), of lower parity, 58 (63.00%), low socioeconomic status, 60 (65.20%), uneducated patients, 72 (78.20%**)**, home deliveries, 68 (73.90%), prolong labour, 54 (58.60), prolong rupture of membranes from 48–72 hours, 68 (73.8%) and deliveries conducted by untrained birth attendants, 57 (60.5%). Puerperal sepsis morbidity was mostly foul smelling discharge, 23 (25%), retained product of conception, 41 (44.5%), peritonitis, 8 (8.60%), septicaemia, 4 (4.3%), pelvic abscess, 10 (10.80%), endotoxic shock, 4 (4.30%), disseminated intravascular coagulation, 2 (2.1%). Sepsis related mortality was 6/42 (14.2%). **Conclusion:** Puerperal sepsis is an important public health problem contributing to maternal morbidity and mortality. Majority of predisposing factors are preventable. Optimal antiseptic measures and careful monitoring are needed throughout the process of labour.

Keywords: Puerperal sepsis, Maternal mortality, Rupture of membranes, Obstructed labour, Traditional birth attendant, TBA, disseminated intravascular coagulation, DIC

INTRODUCTION

Puerperal sepsis has been described since the time of Hippocrates. Puerperal fever (from Latin, puer means child) also called child bed fever is contracted by a women during or shortly after child birth, miscarriage or abortion leading to septicaemia and death. Along with pre eclampsia and obstetrical haemorrhage it has formed the lethal triad of causes of maternal death for many decades. It is the leading cause of preventable maternal morbidity and mortality not only in developing countries but developed countries as well.[1] It is ranked 3rd after hypertensive disorders and haemorrhage in Pakistan.[2]

The first epidemic of puerperal fever occurred at Hotel-Dieu de Paris in 1646. Hospitals in Europe and America reported death rates between 20-25% of all women giving birth and intermittent epidemics with up to 100% fatalities in child birth units.[3] In 1795 Alexander Gordon of Aberdeen Scotland suggested that fever were infectious process and physicians were the carriers, Prof Thomas Watson at Kings College hospital London also recommended hand washing with chlorine.[4]

Puerperal sepsis occurs when Streptococci colonizing the genital tract or acquired nosocomially invade the endometrium, adjacent structures, lymphatic and blood stream.[5] Postpartum birth canal remains susceptible to invasion for several days after delivery. Predisposing factors leading to puerperal sepsis include home births in unhygienic conditions, low socioeconomic status, poor nutrition, primiparas, prolonged rupture of membranes, prolonged labour and postpartum haemorrhage.

Maternal complications include septicaemia, endotoxic shock and peritonitis or abscess formation leading to surgery and compromised future fertility. Exogenous infections come from external contamination and endogenous organisms consisting of mixed flora colonizing the women's own genital tract are the major sources of infection.

Incidence of PS shows wide variations among published literature. Around the world it is fraught with difficulty because the aetiology and epidemiology of sepsis vary enormously as a result of local conditions in particular with regard to hygiene during delivery and rates of reproductive tract infections.[6] It ranges from 1% to as high as 17%.[7] In USA puerperal infection occurs in between 1-8% of all deliveries and about 3 die from puerperal sepsis/100,000 deliveries.[8] In UK the number of direct maternal deaths from1985–2005 due to genital tract sepsis/100,000 maternities was 0.4–0.85.[9] Global incidence reported to be 4.4% of live births.[6] The incidence reported for Pakistan is 10–15%.[10]

Aseptic precautions, advances in investigative tools and antibiotics have played a

major role in reducing the incidence of puerperal infections. Since puerperal sepsis is a preventable factor of maternal morbidity and mortality the objectives of this study are to identify causative factors and to evaluate maternal morbidity and mortality from sepsis.

MATERIAL AND METHODS

This study was conducted was conducted in Obs/Gyn Unit of Ayub Teaching Hospital, Abbottabad over a period of three years from 1st Jan 2005 to 31st Dec 2007. All women admitted within 42 days of termination of pregnancy with genital tract sepsis were included in the study. Patients who developed pyrexia due to causes unrelated to genital tract sepsis or birth process. All patient records were entered on a proforma including age, parity, socioeconomic status, level of education, general health status, antenatal booking status, place of confinement, duration of labour, birth attendants, mode of delivery, duration of rupture of membranes, history of medical or surgical intervention, nature of symptoms and type of morbidity. Numbers of maternal death due to sepsis were also noted.

RESULTS

A total of 5,268 obstetrical patients were admitted over the period of three years from 1st January 2005 to 31st December 2007. There were 92 patients admitted with puerperal sepsis during the study period. The frequency of puerperal sepsis was 1.74%. Out of 302 patients with puerperal problems there were 92 patients with puerperal sepsis which makes 30.4% of puerperal problems. Demographic details are described in Table-1, antenatal booking status was 0.00%.

Obstetrical details are mentioned in Table-2, maternal morbidity and maternal mortality due to puerperal sepsis is mentioned in Table-3.

Table-1: Demographic profile of the patients

Variable	Number	Percentage
Age Range (Years)		
15–25	61	66.30
26–35	27	29.30
36–45	7	7.60
Parity		
Primipara	58	63.00
Multipara	29	31.50
Grand multi	5	5.40
Education		
Nil	72	78.20
Primary	15	16.30
Middle	5	5.40
Higher Secondary	0	0
Social Status		
Low	60	65.20
Middle	32	34.70
High	0	0

Table-2: Obstetrical profile of the patients

Variables	Number	Percentage
Place of Delivery		
Home	68	37.90
Health Facility	24	26.00
Tertiary Care level	0	0.00
Mode of delivery		
Spontaneous vaginal delivery	70	76.00
Instrumental	12	13.00
Caesarean section	10	10.80
Duration of Labour		
6–12 hrs	9	8.70
12–24 hrs	29	31.50
24–36 hrs	54	58.60
Rupture of membranes		
>24 hrs	8	8.60
>36 hrs	16	17.30
>48 hrs	31	33.60
>72 hrs	37	40.20
Birth Attendant		
Family member	17	18.40
Traditional birth Attendant	40	42.10
Leady Health Worker	22	23.90
Doctor	13	14.10

Table-3: Morbidity and Mortality from sepsis

	Number	Percentage
Vaginal discharge	23	25
RPOCs	41	44.50
Septicaemia	4	4.30
Peritonitis	8	8.60
Endotoxic shock	4	4.30
Pelvic abscess	10	10.80
DIC	2	2.10
Mortality	6	14.20

DISCUSSION

Childbirth is a joyful experience for many but unfortunately it can be a difficult period bringing with it new problems that are laid down in the critical hours of child birth and many more continue to unfold in the days following birth. The sufferings related to child birth make a significant portion of world's ill health and death.[11] Puerperal sepsis an important public health problem is a leading cause of preventable maternal death in both developed and developing world. Accurate data on puerperal sepsis is not available in Pakistan as in many developing countries many cases of puerperal infections can go undiagnosed and under reported. However it is known that 40–50% of spontaneous vaginal deliveries and 50% of instrumental deliveries can get infected when carried out by traditional birth attendants, nurses and lady health workers.[12] Our study reports puerperal sepsis as 1.7% of all obstetrical admissions and 34.4% of post partum complications. A study carried out in medical unit for post partum complications reported 40.5% admissions for puerperal sepsis.[13] A Zambian study reported 34.8% admissions due to puerperal sepsis.[14]

The mothers who developed puerperal sepsis were mostly young (66.3%) and of lower parity (63%).

The reason is young inexperienced mothers land up in the hands of traditional birth attendants and mostly deliver outside health facility due to lack of education regarding health care, antenatal visits and delivery in well equipped well staffed medical facility. They are unfamiliar with the process of labour, its length and complications. It is mostly primiparous mothers who take a long course of labour and trials in various hands before reaching health facility. Another study also support that age and parity tend to be younger, 70% less than 30 years age and 77% having parity of 2 or less.[14,15] There is strong association of prolong labour with puerperal sepsis which occurs in younger mothers of lower parity.

Socioeconomic status in our study is mostly poor. There are higher chances of sepsis in poor females suffering from chronic ill health and malnutrition delivering in unhygienic conditions. They are unable to afford the cost of health facility. For many women poverty combines with cultural constraints that construct a social curtain around them which health services do not penetrate.[16] Majority of births takes place at home where delivery is conducted without aseptic measures. Considering birth as physiological process is the idea coming from their ancestors, they prefer a home delivery where eldest female of the family conducts and controls the process. Women can not embark on care seeking paths even when they know that they have life threatening condition. Other studies also reported high rate (67.2%) of sepsis in low socioeconomic group.[1,18] Poor social set up is associated with illiteracy, poor hygiene, ill health, poor antenatal care, prolonged labour, delayed referrals and pre-labour rupture of membranes all setting the scene for sepsis to settle in. this fact has been supported by a report on state of maternal and child health in Pakistan.[19]

In our study the major proportion of puerperal sepsis is from home deliveries (73.9%). Another study also reveals increase rate of sepsis among home deliveries.[17] In Bangladesh the proportion shown is 91% of home deliveries.[20] Latest government figures show that 76% of deliveries are conducted at home in Pakistan and 90% of them delivered by untrained birth attendants especially in rural areas.[10] It is again highly related to triad of poverty, illiteracy and social constraints. Traditional birth attendants do not practice aseptic measures like hand washing and antiseptic materials to provide clean delivery surface, clean cord cutting, perineal hygiene and antibiotic cover after delivery. Both maternal and neonatal mortality are lower in countries where mother giving birth get skilled professional care, with the equipment, drugs and other supplies needed for the effective and timely management of complications.[21] A study conducted in low resource settings where home delivery is common, the use of a clean home delivery kit coupled with an educational intervention of 'six cleans' showed significant reduction in the incidence of puerperal sepsis.[22] These six are clean hands, clean delivery surface, clean cord cutting instruments, clean perineum and clean cutting surface.

Our study reveals 10.8% cases of puerperal sepsis with caesarean sections. Mode of delivery in itself does not affect sepsis rate if optimal aseptic measures are taken. Increase rate of sepsis has been reported for caesarean deliveries by various studies.[23,24] It is basically circumstances that lead to caesarean section and settle the basis for infection. There is more tissue exposure/trauma and manipulation than vaginal delivery. Genital tract sepsis occurs with increased frequency where caesareans are performed for obstructed labours, prolonged labour and chorioamnionitis.[25,26] Prolonged rupture of membranes, prolonged labour, multiple vaginal examinations during labour, caesarean section, obstetrical manoeuvres are closely related predisposing factors for puerperal sepsis.[1,27]

There is increase rate of sepsis with prolonged labour in our study (58.6%). Duration of labour directly contributes to development of postnatal sepsis as prolonged labour/obstructed labour with repetitive vaginal examinations leads to sepsis as a result of prolonged state of an open cervix often with ruptured membranes impairing natural mechanical barriers to ascending infection from vagina.[25] Vacca *et al* has reported that operative delivery was significantly associated with sepsis especially when it followed prolonged labour.[28] Other studies also support that sepsis is most frequent morbidity associated with obstructed labour.[29] Benjamen reported 57% of puerperal sepsis cases with obstructed labour.[30]

The most frequent morbidity due to puerperal sepsis is puerperal fever and foul smelling vaginal discharge secondary to retained products (44.5%). Pelvic abscess and peritonitis were next common complications of sepsis. Our puerperal morbidity was 34.4%. Disseminated intravascular coagulation and endotoxic shock were extremely serious complications leading to maternal death in our study. Two other studies reported puerperal morbidity as 40%[13] and 34.8%[14] which is quite comparable to our study.

Morbidity from puerperal sepsis can be reduced by conducting deliveries in well organized maternity units with all aseptic precautions, community awareness regarding improvement of general health of women of reproductive age group, educational status, antenatal booking and improvement in living standards.

Puerperal sepsis related mortality is 14.2% in our study. The mortality reported by other studies is 19.2%.[31] An estimated 15% of all direct maternal deaths are due to sepsis.[32] National figures for Pakistan show that 15% of maternal deaths are due to sepsis.[33] It is still

3rd major cause of death after haemorrhage and hypertensive disorders. Two other studies also reported sepsis to be the 3rd common cause for mortality.[31,34] In another study it is stated 9.7% of maternal deaths and 9.38% are due to sepsis.[35,36] Figures for UK are 4.38% of maternal deaths from sepsis.[37]

Puerperal sepsis mortality can be prevented by early diagnosis and management. Important is to make early referral before irreversible complications develop. Mortality depends greatly upon management of puerperal sepsis adequately in well equipped set up which offers facilities to manage complications.

CONCLUSION

It is evident from our study that puerperal sepsis is still a major cause of maternal morbidity and mortality. Almost all predisposing factors leading to sepsis and maternal mortality are preventable. It needs proper implementation of protocols for antenatal, intranatal and post natal care, continuing perinatal education programs for midwives, TBAs and doctors for proper management during labour, aseptic measures, prophylactic antibiotics, proper hand washing, avoiding unnecessary repeated vaginal examinations, prolonged labour, observing partogrames, avoiding unnecessary interventions in premature/pre-labour rupture of membranes proper and timely referrals to health facility.

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