ejpmr, 2018,5(4), 569-573

SJIF Impact Factor 4.897

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Review Article

ISSN 2394-3211

EJPMR

PUERPERAL SEPSIS AT USMANU DANFODIYO UNIVERSITY TEACHING HOSPITAL, SOKOTO: A TEN YEAR REVIEW

Bilal Sulaiman[1]*, Karima Abubakar Tunau[2], Sadiya Nasir[3], Mairo Hassan[2] and Yakubu Ahmed[2]

[1]Department of Obstetrics and Gynaecology, University of Abuja Teaching Hospital, Abuja.
[2]Department of Obstetrics and Gynaecology, Usmanu Danfodiyo University Teaching Hospital, Sokoto.

***Corresponding Author: Dr. Bilal Sulaiman**

Department of Obstetrics and Gynaecology, University of Abuja Teaching Hospital, Abuja.

Article Received on 19/02/2018 **Article Revised on 11/03/2018** **Article Accepted on 31/03/2018**

ABSTRACT

Background: Puerperal sepsis, an infection of the genital tract following childbirth is among the leading causes of maternal morbidity and mortality. Developing countries are the worst affected. It occurs as intrauterine infection preceding or during labour (clinical chorioamnionitis) and early postpartum infection following child birth (postpartum endometritis). **Objectives:** To determine the incidence of puerperal sepsis, organisms and sensitivity pattern as well as morbidity and mortality associated with puerperal sepsis. **Materials and method:** This was a 10 year retrospective cohort study of women managed for puerperal sepsis from January, 2008 to December, 2017. Records of women with puerperal sepsis were obtained from the postnatal and labour wards, operating theatre, accident and emergency unit and medical records. Data entry and analysis was done with IBM SPSS v23. **Results:** The incidence of puerperal sepsis was 0.9% and the mean age of the women was 26.2 ± 5.4 years. The modal parity was 1 and 84.9% of the women had no antenatal care. The most common organism isolated was *Staphylococcus aureus*, 13.6% and ceftriaxone 10.1% was the most sensitive antibiotic. Anaemia 6.2% was the most common morbidity and maternal mortality was 15.1%. **Conclusion:** The incidence of puerperal sepsis is low from this study. While majority of the women did not have any complication, mortality due to puerperal sepsis is high. Culture and sensitivity of causative organisms will be worthwhile for individualised treatment.

KEYWORDS: Puerperium, Sepsis, Sokoto.

INTRODUCTION

Childbirth is a life changing event associated with joy. Unfortunately, It can also be a difficult period, bringing with it new problems like puerperal sepsis. Puerperal sepsis is one of the leading problems women can face following child birth.[1] Puerperal sepsis is defined as infection of the genital tract occurring at any time between the rupture of membranes or labour and the 42nd day postpartum in which two or more of the following are present: pelvic pain, fever (oral temperature 38.5^{o}C or higher on any occasion) abnormal vaginal discharge, abnormal smell or delay in the rate of reduction in the size of the uterus (less than 2 cm per day during the first eight days).[1, 2] As with other obstetric morbidities, the definitions of puerperal sepsis vary from one study to another, which make their comparison difficult. Moreover, hospital based studies are not reliable sources of data for developing countries, because many women do not have access to health facilities, for many reasons. Some of the reasons include geographical distance, financial constraints, and cultural beliefs. Thus the population of patients that deliver in hospital may not be representative of the general obstetric population.[2]

Puerperal sepsis is the third leading cause of maternal mortality, accounting for 10-12% of maternal death.[2] Deaths due to puerperal sepsis are disproportionately higher in low income countries. The risk of death from puerperal sepsis is 2.7 fold higher in Africa, 1.9 fold higher in Asia, and 2.1 fold higher in Latin America than in developed countries.[2]

The reported incidence of puerperal sepsis in developing countries ranged from 0.1 – 10%, but the true incidence is difficult to determine.[2] The wide incidence range most likely reflects discrepancies in diagnostic criteria and lack of access to healthcare. Case fatality rates of puerperal sepsis as high as 30 – 50% have been reported in Low and Middle income countries.[2]

Puerperal sepsis occurs as two distinct clinical syndromes, intrauterine infection preceding or during labour (clinical chorioamnionitis) and early postpartum infection following child birth (postpartum endometritis).[2] These infections usually represent ascending infections from the lower genital tract.[3] They share a common microbial aetiology, risk factors, and clinical features (fever and uterine tenderness), and both are associated with neonatal infectious sequelae.

Chorioamnionitis is a common complication of pregnancy that may lead to adverse maternal, foetal, and neonatal outcomes.[4] The resulting infection triggers a maternal and foetal inflammatory response and may lead to infection of the foetus, premature rupture of the membranes, preterm labour and neonatal complications.[2] Postpartum endometritis is an infection of the uterus that occurs in 5% of all vaginal births and 10% of caesarean deliveries in high income countries, but was inconsistently reported in low and middle income countries.[2] Postpartum endometritis is commonly caused by ascending infections from bacteria indigenous to the lower genital tract flora, although exogenous sexually transmitted microorganisms including *Nisseria gonorrhoeae* and *Chlamidia trachomatis* may also cause postpartum endometritis. Caesarean section is an important risk factor for postpartum endometritis.[2,5]

Historically, puerperal sepsis has been a common pregnancy-related condition, which could eventually lead to septic shock or death.[1] During the 18th century it took on epidermic proportions, particularly when home delivery practice changed to delivery in hospital, as there still was total ignorance of sepsis.[1] Aseptic precautions, advances in investigation tools and the use of antibiotics have played a major role in reducing the incidence of puerperal sepsis worldwide.[6]

OBJECTIVES

The objective of this study is to determine: the incidence of puerperal sepsis at Usmanu Danfodiyo University Teaching Hospital Sokoto; the organisms involved and the antibiotic sensitivity; the maternal morbidities and mortality associated with puerperal sepsis.

MATERIALS AND METHOD

This was a retrospective cohort study of all patients who had puerperal sepsis over a 10 year period from January 2008 to December 2017. The inclusion criteria were fever (temperature 38.5^{o}C,) foul smelling vaginal discharge, or pelvic pain between rupture of foetal membranes to 42nd day postpartum and the exclusion criteria was any of the above symptoms that occurred after puerperium. A list of patients was obtained from the lying in ward, labour room, operating theatre and accident and emergency records. Case files of patients were retrieved. Information obtained from the files included sociodemographic data, parity, place of delivery, mode of delivery, presenting complaint, microbiology result, and complications. The data obtained was presented in simple tables.

RESULTS

There were 28104 deliveries during the period under review among which there were 264 cases of puerperal sepsis. This gave an incidence of 0.9%. Two hundred and fifty eight (97%) files were available for analysis.

Table 1: Sociodemographic characteristic of participants.

Characteristic	Frequency	%
Age		
15-19	32	12.4
20-24	58	22.5
25-29	95	36.8
30-34	48	18.6
35-39	21	8.1
40-44	4	1.6
Education Status		
No formal education	138	53.5
Primary education	13	5.0
Secondary Education	95	36.8
Tertiary Education	12	4.7
Occupation of patients		
Unemployed	251	97.8
Student	2	0.8
Civil Servant	2	0.8
Businesswoman	3	1.2
Parity		
1	54	20.9
2	46	17.8
3	37	14.3
4	33	12.8
5	88	34.1

The ages of the patients ranged from 16 – 40 years and the mean age was 26.2 ± 5.4 years. Majority of the patients 138 (54.3%) were not formally educated and unemployed 251 (97.8%).

Puerperal sepsis occurred more frequently in unbooked patients, 291 (84.9%) than in booked patients 39 (15.1%).

Table 2: Presenting complaints and duration of symptoms.

Parameter	Frequency	%
Presenting complaints		
Fever	140	54.3
Vaginal Discharge	89	34.5
Abdominal Pain	58	22.5
Abdominal Swelling	58	22.5
Vomiting	16	6.2
Vaginal bleeding	9	3.5
Duration of symptoms		
<24 hours	24	9.3
1 – 7 days	147	57.0
8 – 14 days	62	24.0
15 – 21 days	15	5.8
> 21 days	10	3.9

Table 2 shows that fever 140 (54.3%) was the most common presenting complaint while most of the patients presented within the first seven days of development of symptoms 147 (57.0%). Only 24 (9.3%) presented within the first 24 hours of the onset of symptoms.

Also 21.6% of the patients had premature rupture of foetal membranes while 78.4% did not had premature rupture of foetal membranes.

Table 3: Events related to the delivery of the participants.

Parameter	Frequency	%
Place of delivery		
Home	226	87.2
Hospital	32	12.4
Accoucheur		
Traditional birth attendant	194	75.2
Relation/Neighbour	15	5.8
Self	12	4.7
Midwife/Nurse	13	5.0
Community health Officer	5	1.9
Doctor	19	7.4
Site of delivery		
Bedroom	213	82.6
Siting room	7	2.7
Toilet	2	0.8
Hall	1	0.4
Labour room	33	12.8
Theatre	2	0.8
Mode of delivery		
Spontaneous vaginal delivery	246	95.3
Instrumental delivery	8	3.1
Assisted vaginal delivery	2	0.8
Caesarean section	2	0.8

From table 3 shows that majority of the patients 226 (87.2%) delivered at home and the accoucheur was traditional birth attendant in 194 (75.2%). Two hundred and thirteen (82.6%) women had their deliveries conducted in the bed room and 246 (95.3%) of the patients had spontaneous vaginal delivery. Forty one (18.2%) the women lost their babies.

Table 4: Bacteria isolates and sensitivity pattern in women with puerperal sepsis.

Parameter	Frequency	%
Bacteria Isolate		
No sample for bacteriaology	132	51.2
No growth	56	21.7
Staphylococcus aureus	35	13.6
Streptococcus spp	12	4.7
Mixed growth	8	3.1
Pseudomonas spp	5	1.9
Escherichia coli	4	1.6
Klebsiella spp	3	1.2
Peptococcus spp	3	1.2
Sensitivity Pattern		
Ceftriaxone	28	10.9
Ofloxacin	18	7.0
Gentamicin	9	3.4
Ampiclox	5	1.9
Ciprofloxacin	5	1.9
Amoxicilin	4	1.6
Erythromycin	4	1.6
Cotrimoxozole	4	1.6
Clavulanic acid	4	1.6
Ampicillin	3	1.2
Resistant to all	2	0.8

Table 4 shows that about half 132 (51.2%) of the patients did not have endocervical swab for microbiological study and in those that had it done the most common organism cultured was *Staphylococcus aureaus* 35 (13.6%). The organisms isolated were most sensitive to Ceftiaxone 28 (10.9%).

Table 5: Complications of puerperal sepsis among participants.

Complication	Frequency	%
No complication	180	69.8
Death	39	15.1
Anaemia	16	6.2
Acute kidney injury	9	3.5
Septicaemia	8	3.1
DIC	4	1.6
Psychosis	4	1.6

Table 5 shows that 180 (69.8%) had no complication while mortality was 39 (15.1%). Anaemia (35.1%) was the second most common complication among the patients.

DISCUSSION

From this study, the incidence of puerperal sepsis is 0.9%. This is similar to the findings in Maiduguri (0.78%).[5] Similarities in cultural practice may account for this. However the incidence is lower than 1.7% found in Ife and 16.7% found in Jos. [7,8] This may reflect better health seeking behaviour among patients in those areas. The mean age of the patients studied was 26.2 ± 5.4 years and the incidence of puerperal sepsis was highest among the age group of 25 – 29 years.

Majority (97.8%) of the patients were unemployed and not formally educated (53.5%). Sokoto is one of the less educationally developed states in Nigeria.[9] Ignorance and poverty have been shown to affect cultural practices, health seeking behaviour and even early presentation to hospitals when complications develop.[10-12] Ignorance is a major barrier to hospital delivery and presentation to hospital when complication arises. Where the patients or their relatives are not educated, poverty can be a barrier to hospital care because of increased cost and lack of health insurance.

From this study it was found that patients who were Para 1 constituted the majority of the patients with puerperal sepsis (20.9%). This is in contrast to study from Jos that showed a higher incidence among Para 2 – 4.[13] Cultural values and the husband's choice strongly determine the place of delivery of a woman in this environment.[14] Early marriage is a common practice here and at the time of marriage the girl may not be educated. Additional in this environment women deliver their first and sometimes second babies at their parent's home irrespective of the booking status of the woman and most of the deliveries at home are unsupervised. These may help explain the high incidence of puerperal sepsis among the para 1 group.

The incidence of puerperal sepsis (84.9%) was found to be higher among unbooked patients. This is similar to findings from Maiduguri and Ife where 88%[5] and 71%[7] of the patients were unbooked. During antenatal care clients are educated continuously on the benefits of antenatal care, hygiene, nutrition, hospital delivery and presentation to hospital when problems arises. Unbooked patient will not benefit from this continues education programme as such she may not have the benefit of hospital delivery.

Most (57.0%) of the patients presented between day one to seven of onset of symptoms. Early presentation may allow for early prevention and treatment of complications by early detection. Most of the patients that presented early did not have complications.

It was found from this study that majority (87.2%) of patients had unsupervised home deliveries. This is higher than 59.1% reported from Maiduguri.[5] The aversion to hospital delivery and the need for privacy of the home may be stronger in our patients. Among those that delivered at home, most had their labour conducted by a traditional birth attendant in their bed room. In these situations ensuring asepsis and observing universal precaution may be a major challenge.

Most (95.3%) of the patients that had puerperal sepsis had a spontaneous vaginal delivery and among the patients 18.7% of the patients had neonatal deaths. During an unsupervised vaginal delivery, there is increased risk of genital tract infection since universal precaution is not practiced as such the neonate is exposed to the risk of sepsis and death also there may be foetal compromise during labour which cannot be detected in an unsupervised labour and birth asphyxia and neonatal death may occur.

The most common presentation among the patients was fever (54.3%) and there was history of drainage of liquor in 21.6% of the patients. Findings from Amsterdam revealed that premature rupture of membrane is an independent risk factor for puerperal sepsis.[15]

More than half of these patients (51.2%) did not have endocervical swab sample taken for microscopy, culture and sensitivity. Possible explanation could be that they presented during weekends or outside working hours of working days when laboratory services were skeletal. In this centre some laboratory services like microscopy culture and sensitivity are not entertained due to lack of enough staff during call hours. Among those that had their samples taken for culture and sensitivity, 21.7% had no growth from the culture. The initiation of antibiotics before samples were taken especially during the weekend may account for this. The organism cultured most was *Staphylococcus aureus* (13.6%) followed by *Streptococcus spp* (4.7%) and mixed growth (3.1%). In Maiduguri, 35.4% of the organism cultured was *Staphylococcus aureus* and 20.3% were polymicrobial[7] while in Sudan 39.5% was *staphylococcus aureus.*[16] Unlike in studies from Holland, *Streptococcus speciae* is the most common organism isolated followed by polymicrobial isolates.[15] This may indicate that the commonest organism that causes puerperal sepsis in the tropical Africa is *Staphyloccocus aureus*, it can also be polymicrobial. This may be due to similarities in host genetic make up, immune status and sociocultural characteristics. There could also be possibilities of contamination and wrong sampling technique.

The organisms cultured were must sensitive to Ceftriaxone in 10.9% of cases followed by ofloxacine in 7.0% of cases. Use of Ofloxacine poses a challenge in breast feeding mothers since it is contraindicated in pregnancy and breastfeeding mothers. However it can safely be administered in non breast feeding mothers or where the benefit outweighs the risk. This is another area that needs to be explored further.

More than half (69.8%) of patients did not suffer any complication from puerperal sepsis, however 15.1% died. All the patients that died presented after the second week of onset of symptoms except three of them that presented within seven days of onset of symptoms. Low socioeconomic status of the patients is always a challenge to presentation and treatment. Some of the antibiotics used in treating puerperal sepsis like Ceftriaxone are expensive. Patient and their relative may not be able to purchase such drugs, in addition to supportive treatment offered to them.

CONCLUSION

The incidence of puerperal sepsis is low in this hospital based study. Puerperal sepsis is higher in uneducated, unemployed and unbooked patients with low parity who had unsupervised home deliveries. There is significant perinatal death among the patients. The most common organism isolated was *Stapyloccocus aureus* and this organism was most sensitive to Ceftriaxone. Most patients survived puerperal sepsis and less than half developed complications. Puerperal sepsis is an infectious disease and is indeed preventable. Community health education and girl child education will improve the health seeking behaviour in this environment. Improved personal and environmental hygiene will minimize microbial load. In addition poverty alleviation and health insurance will make health care affordable. Safe delivery practices at primary health centres by trained birth attendants and twenty four hour full laboratory services every day of the week will go a long way in prevention of this dreaded maternal disease.

REFERENCES

1. Momoh MA, Ezurgwuwie OJ, Ezeigwei HO. Causes and management of puerperal sepsis: The health personnel view point. *Advanced Bio Research*, 2010; 4(3): 154–158.
2. Dole C, Stein C. Global burden of maternal sepsis in the year 2000: Evidence and information for policy (EIP), World Health Organisation, Geneva, 2003.
3. Wandabawa JN, Doyle P, Lengo-Mbenza B, Kiondo P, Khainza B, Othiono E, et al. Human immunodeficiency virus and AIDS and other important predictors of maternal mortality in Mulogo Hospital Complex, Kampala, Uganda. *BMC Public Health*, 2011: 565. doi:10.1186/1471-2458-11-565 available online at http//www.biomedcentral.com/1471-2458/11/565. Accessed on 3/1/18.
4. Ekwempun CC, Otubu JAM. Abnormal puerperium. In: Agboola AA. (ed.) *Textbook of Obstetrics and Gynaecology* 2nd ed. Ibadan: Heinemann Books, 2008; 504–508.
5. Bako B, Audu BM, Lawan ZM, Umar JB. Risk factors and microbial isolates of puerperal sepsis at the University of Maiduguri Teaching Hospital, Maiduguri, North-eastern Nigeria. *Arch Gynaecol Obstet*, 2012; 285(4): 917–927.
6. Chisembele M.The global incidence of puerperal sepsis, Geneva foundation for medical education and research postgraduate training course in reproductive health. Geneva: WHO, 2004; 477–479.
7. Dare FO, Bako AU, Ezechi OC. Puerperal postpartum complication. *Trop Doct*, 1998; 28(2): 92–95.
8. Mutihir JT, Utoo BT. Postpartum maternal morbidity in Jos, North central Nigeria. *Niger J Clin Pract*, 2011; 14: 38–42.
9. National Population Commision, ICF Macro. *National Demographic and Health survey 2008*. National population commission. Abuja, Nigeria, 2009; 13–14.
10. Kullima AA, Kawuwa MB, Audu BM, Geidam AD, Mairiga AG. Trends in maternal mortality in a tertiary institution in Northern Nigeria. *Ann Afri Med.*, 2009; 8(4): 221–224.
11. Ahmad MI, Alsammani MA, Babiker R. Puerperal sepsis in a rural hospital in Sudan. *Mater Socio Med.*, 2013; 25(1): 19–22.
12. Odia LO, Omotunmwan SI. Educational system in Nigeria: Problems and prospects. *J Soc Sci.*, 2007; 14(1): 81–86.
13. Mutihir JT, Utoo BT. Postpartum maternal morbidity in Jos, North central Nigeria. *Niger J Clin Pract*, 2011; 14: 38–42.
14. Ekele BA, Tunau KA. Place of delivery among women who had antenatal care in a teaching hospital. *Acta Obstet Gynecol Scand*, 2007; 86(5): 627–630.
15. Datten JV, Zwart J, Schutta J, Roosmalan JV. Maternal sepsis, epidemiology, etiology and outcome. *Curr Opin Infect Dis*., 2010; 23: 249–259.
16. Ahmad MI, Alsammani MA, Babiker R. Puerperal sepsis in a rural hospital in Sudan. *Mater Socio Med*, 2013; 25(1): 19 – 22.