



## Pattern and determinants of puerperal pyrexia among postnatal women at the Alex Ekwueme Federal University Teaching Hospital, Abakaliki, Southeast, Nigeria

Nwafor Johnbosco Ifunanya<sup>1</sup>, Obi Chuka Nobert<sup>2</sup>, Obi Vitus Okwuchukwu<sup>3</sup>, Ibo Chukwunenye Chukwu<sup>4</sup>, Ugoji Darlington-Peter Chibuzor<sup>5</sup>, Onwe Blessing<sup>6</sup>

<sup>1-6</sup> Department of Obstetrics and Gynaecology, Alex Ekwueme Federal University Teaching Hospital, Abakaliki, Nigeria

### Abstract

**Background:** Puerperal pyrexia is generally accepted among clinicians as a sign of infection that must be determined and managed to prevent adverse sequelae associated with underlying cause.

**Objective:** The objective of this study was to determine the incidence, pattern, predisposing factors and aetiologic agents of puerperal pyrexia at the Alex Ekwueme Federal University Teaching Hospital, Abakaliki, Southeast, Nigeria.

**Materials and Methods:** This was a prospective descriptive study of all cases of women that had puerperal pyrexia at Alex Ekwueme Federal University Teaching Hospital, Abakaliki over a 4-year period. The statistical analysis was done using SPSS version 22.

**Results:** During the study period, there were 203 cases of puerperal pyrexia and 12,902 deliveries. The incidence of puerperal pyrexia was 15.7 cases per 1000 deliveries. Most of the women 82(40.4%) were aged between 27-32 years, grand multipara (43.8%) and unbooked (69.5%). Common risk factors included prolonged rupture of membranes (78.3%), prolonged labour (71.9%) and caesarean section (55.7%). Surgical wound infection was the commonest cause (39.9%) of puerperal pyrexia. The commonest complication of puerperal infection is septicaemia (43.4%). Maternal death attributable to postpartum infection was 3.9%.

**Conclusion:** Puerperal pyrexia is a preventable and treatable condition, however, timely recognition and early treatment of underlying cause is important in order to avert maternal morbidity and mortality associated with it. Adoption of universal aseptic technique in the care of patients will reduce the incidence of wound infection.

**Keywords:** Puerperal pyrexia, Determinants, Maternal mortality, Abakaliki

### Introduction

Puerperal Pyrexia is defined as the presence of a fever, which is greater than or equal to 38, in a woman within 6 weeks of delivery [1, 2]. The presence of puerperal pyrexia is generally accepted among clinicians as a sign of infection that must be determined and managed to prevent adverse sequelae associated with puerperal sepsis [2].

Local spread of colonizing bacteria is the most common aetiology for postpartum infection following delivery [3]. Endometritis is the most common cause of pyrexia in the postpartum period [3]. Other causes of puerperal pyrexia include malaria, postsurgical wound infection, mastitis, breast abscess, urinary tract infection, pneumonia and septic pelvic thrombophlebitis [1-8]. The predisposing factors leading to the development of puerperal sepsis include home birth in unhygienic conditions, low socioeconomic status, poor nutrition, anaemia, prolonged rupture of membranes, prolonged labour, Multiple vaginal examinations in labour, caesarean section, and postpartum haemorrhage [1-13].

Puerperal sepsis is one of the major causes of preventable maternal morbidity and mortality in the developing countries [1-6]. World Health Organization estimated that about 800 women die from pregnancy- or childbirth-related complications around the world daily and puerperal sepsis contributes about 15% of

these deaths [3]. Majority of maternal mortality (99%) occur in developing countries, and most can be prevented [3]. Unfortunately, Nigeria has one of the highest cases of maternal mortality after India with an annual death estimate of 52000, which is 14% of the annual estimates of maternal mortality worldwide [1].

Most postpartum infections take place after hospital discharge, which is usually after 48 hours following delivery [6]. In the absence of postnatal follow-up, as is the case in many developing countries, many cases of puerperal infections go undiagnosed and unreported [7]. A study in Benin City showed that the incidence of puerperal pyrexia among postnatal women was 6.44% [1]. Despite advances in patient care, the mortality rate associated with maternal sepsis remain high in developing countries [8]. Health-care services in low income countries face peculiar problems that account for an increased incidence of puerperal sepsis and maternal mortality. They include poor health infrastructure, poverty, and lack of access to health care [9].

Complications of puerperal pyrexia include sepsis, endotoxic shock, pelvic abscess, Asherman syndrome, infertility and death [1-5].

Early recognition, appropriate investigations and prompt treatment are keys to successful management. The treatment of puerperal pyrexia depends on the underlying cause. The prognosis for postpartum infections is good with prompt and appropriate treatment [1-7].

A medline literature search did not yield any previous study on the subject matter in this locality. Considering the contribution of puerperal pyrexia to maternal mortality, the study is important. The findings of this study may help the policy makers and other stakeholders plan on how to implement preventive measures that would remarkably reduce the contribution of puerperal sepsis to maternal mortality in this environment.

The aim of this study was to determine the incidence, pattern, predisposing factors and aetiologic agents of puerperal pyrexia at the Alex Ekwueme Federal University Teaching Hospital, Abakaliki, Southeast, Nigeria.

**Materials and Method**

**Study area:** Abakaliki is the capital of Ebonyi state which is in the South-east geopolitical zone of Nigeria. It has a total population of 267,386 [17].

Alex Ekwueme Federal University Teaching Hospital, Abakaliki is a tertiary institution located in the State capital. It receives referral from all parts of the state and neighbouring states of Benue, Enugu, Cross River and Abia as well as other part of the country.

The Obstetrics and Gynaecology department is one of several departments in the hospital. The obstetric patients are seen in the antenatal, postnatal and family planning clinics; labour, antenatal, and intensive care unit as well as obstetric theater.

**Study design:** This was a prospective descriptive study of puerperal pyrexia among postnatal women at the Alex Ekwueme Federal University Teaching Hospital, Abakaliki. The period under review was 1<sup>st</sup> January 2014 to 31<sup>st</sup> December 2017.

**Data collection and sample collection and analysis:** A proforma containing information on sociodemographic characteristics, parity, booking status, and labour characteristics was used to extract information from the case notes of postpartum

women who had fever (temperature >38°C) within 6 weeks of delivery. Blood samples from consenting women were collected under aseptic conditions for the diagnosis of malaria parasite. High vaginal swab and surgical site swabs were collected from subjects with genital tract infections and surgical site infections respectively. Mid-stream urine samples were also collected. The samples were taken to the hospital laboratory for microbiological analysis.

**Statistical data analysis:** The statistical analysis was done using SPSS version 22. Categorical variables are presented as frequencies and percentages while continuous variables are presented as mean ± standard deviation.

**Ethical consideration:** The approval for the study was obtained from the Research and Ethical Committee of the Alex Ekwueme Federal University Teaching Hospital, Abakaliki.

**Results**

During the study period, there were 203 cases of puerperal pyrexia and 12,902 deliveries. The incidence of puerperal pyrexia was 15.7 cases per 1000 deliveries. Most of the women 82(40.4%) were aged between 27-32 years, had no formal education (49.8%) and were farmers (56.7%) (table 1). Women who were para 5 or more accounted for 43.8% of women with puerperal pyrexia. Majority of women (69.5%) were unbooked (table 1). Most women (87.2%) had spontaneous onset of labour. On admission, 78.3% of women had membrane rupture. Prolonged labour occurred in 71.9% of the women and 55.7% had caesarean section. Majority of the women (61.8%) were delivered in the hospital (table 2). Surgical wound infection is the commonest cause (39.9%) of puerperal pyrexia. Endometritis and malaria accounted for 30.5% and 20.2% respectively (table 3). The commonest microorganism isolated was Staphylococcus aureus (46.9%). Other microorganisms implicated as the infective cause of puerperal pyrexia were Escherichia coli (32.1%) and Streptococcus species (12.4%) (table 4). The commonest complication was septicaemia (43.4%) (table 5). Maternal death attributable to puerperal sepsis was 3.9%.

**Table 1:** Sociodemographic characteristics of women with puerperal pyrexia

Characteristic	Number	Percentage (%)
Age range (years)		
15-20	42	20.69
21-26	40	19.70
27-32	82	40.40
33-38	30	14.78
≥39	9	4.43
Education qualification		
No formal education	101	49.75
Primary	78	38.42
Secondary	21	10.34
Tertiary	3	1.48
Occupation		
Housewife	21	10.34
Farmer	115	56.65
Trader	55	27.09
Civil servant	12	5.91

Parity		
Nullipara	40	19.70
Para 1-4	74	36.45
≥ Para 5	89	43.84
Booking status		
Booked	62	30.54
Unbooked	141	69.46

**Table 2:** Distribution of labour characteristics of women with puerperal pyrexia

Characteristic	Number	Percentage (%)
Mode of onset of labour		
Spontaneous	177	87.19
Induced	26	12.81
Status of membranes on admission		
Intact	44	21.67
Ruptured	159	78.33
Duration of labour		
Prolonged (>12 hours)	146	71.92
Not prolonged	57	28.08
Mode of delivery		
Spontaneous vaginal	82	40.39
Instrumental vaginal	8	3.94
Caesarean section	113	55.67
Place of delivery		
In-hospital	124	61.08
Peripheral	79	38.92

**Table 3:** Distribution of aetiology of puerperal pyrexia

Aetiology	Number	Percentage (%)
Malaria	41	20.20
Wound infection	81	39.90
Pneumonia	10	4.93
Mastitis/breast abscess	2	0.99
Endometritis	62	30.54
Urinary tract infection	7	3.45

**Table 4:** Distribution of microbial isolates

Microbial agent	Number	Percentage (%)
Staphylococcus aureus	76	46.91
Escherichia coli	52	32.10
Streptococcus species	20	12.35
Polymicrobial	40	8.64

**Table 4:** Distribution of maternal complications

Complication	Number	Percentage (%)
Disseminated intravascular coagulation	2	0.99
Septicaemia	88	43.35
Death	8	3.94

## Discussion

The incidence of puerperal pyrexia in this study was 15.7 cases per 1000 deliveries. This was less than the incidence of 64.4 per 1000 deliveries found in a study done in Benin city<sup>1</sup> and the incidence of 62.8 per 1000 deliveries in India<sup>[11]</sup>. This study further confirmed that puerperal infections, though less common in developed countries, is still a huge burden in our environment influencing maternal morbidity and mortality profiles.

In this study, the puerperal pyrexia was common in women who are in age range between 27 and 32 years, grandmultiparous

(43.8%) and unbooked (69.5%). This findings are similar to those in the studies done in Ife, Sudan, Maiduguri and Pakistan<sup>[8, 9, 11, 12]</sup>. In developing countries, these are the group of women who suffers infective morbidities due to poverty, illiteracy and malnutrition. They commence their pregnancy in poor condition and have low resistance for infection. These women do not usually seek antenatal care.

The findings of this study showed that most of the women were undelivered referred cases from home of traditional birth attendants where they may have had multiple unsterile vaginal

examinations. Majority of these women (78.3%) had prolonged rupture of membranes at the time of admission. In these women, second stage of labour was prolonged, so the rate of second stage intervention by caesarean section (55.7%) as well as instrumental delivery (3.9%) was high. This finding is comparable to other studies from Benin, Maiduguri and India <sup>[1, 11, 14]</sup>.

Wound infection was the commonest cause (39.9%) of puerperal pyrexia in this study. Other causes include malaria (20.2%), endometritis (30.5%), pneumonia (4.9%) and urinary tract infection (3.45%). This findings were similar to the findings of a study in Benin, Ife, Sudan and Pakistan <sup>[1, 8, 9, 14]</sup>. However, this is far higher than the findings in a study in Sweden <sup>[15]</sup>. Infective morbidities still remain a huge challenge in the developing world. The commonest microorganism implicated in the infective cause of puerperal pyrexia in this study was *Staphylococcus aureus* (49.9%). Other microbial isolates include *Escherichia coli* (32.1%), and *Streptococcus species* (12.4%). Fourteen (8.6%) women had polymicrobial isolates. This finding was similar in a study in Maiduguri where *Staphylococcus aureus* were the commonest organism (35.4%) followed by *Escherichia coli* (20.9%) <sup>[12]</sup>. This findings is important as the knowledge of common infective organisms can be a guide to antibiotic administration especially in developing countries where microbial culture and sensitivity tests could not be performed due non-functioning or suboptimal laboratory services, or in settings where patients are poor and unable to for laboratory investigations.

In this study, the morbidities seen were septicaemia in 43.4% of cases and disseminated intravascular coagulation in 1%. Eight women (3.9%) suffered maternal death due to puerperal sepsis. This findings was less than the findings of studies in Maiduguri and Pakistan where maternal mortality from puerperal sepsis were 10.4% and 8.52% <sup>[8, 14]</sup>. The high rate of morbidity and mortality could be due to late referral, operative interventions in established septic women and poor antibiotics prescribing practices. Characteristic problems related to infection control in developing countries include poor antibiotics prescribing practices, poorly functioning laboratory services, lack of surveillance data and suboptimal design or construction of buildings and water and sanitation systems <sup>[14]</sup>. Overcrowding of facilities and insufficient number of health workers are common. Increased bed numbers, nurse to patient ratio and bed space are known to have negative effects on infection transmission <sup>[8, 14]</sup>. Lack of commitment by policy makers and health managers contribute to poor quality of service delivery <sup>[11]</sup>. Considering all these factors, proper education, training regarding aseptic techniques in patients care and proper antibiotic use will help reduce this preventable maternal morbidity and mortality from sepsis. The limitations of this study include the fact that the long term complications of puerperal infection was not factored in the study because most of the patients were lost to follow-up.

### Conclusions

Puerperal pyrexia is preventable and treatable condition, however, timely recognition and early treatment of underlying cause is important in other to avert maternal morbidity and mortality associated with it. Good skin preparation before caesarean section and astute post-caesarean wound care are

necessary to reduce the incidence of wound infection. There is need to enlighten women on the need for booking, skilled attendant at delivery, hospital delivery under aseptic conditions and the need to present to hospital in cases of postpartum fever.

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