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RESEARCH ARTICLE

A prospective study on puerperal pyrexia in a tertiary care hospital

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ABSTRACT

Objective: The objective of this study to find out the incidence of puerperal pyrexia, probable etiology, role of risk factors and evaluate the maternal outcome in case of puerperal pyrexia. **Materials and methods:** The present study is a prospective hospital based observational study carried out in the department of Obstetrics and Gynaecology at Netaji Subhash Chandra Bose Medical College and Hospital Jabalpur (Madhya Pradesh) from 1st March 2019 to 31 August 2020. During the study period 167 out of 3000 patients have developed puerperal pyrexia. We included all cases admitted and delivered (>28 week of gestation and < 42 days of delivery) in our center, (temperature >38 ^{0} C or 100^0 F for two episode, at least 6 hours apart following the first 24 hours after delivery). The data included the detailed history and clinical examination with all relevant laboratory investigation. All cases were evaluated for complication and maternal outcome. **Result:** The incidence of puerperal pyrexia is 5.57 per thousand deliveries. The common predisposing factors were primiparity, referred cases, greater no. of PV examination, absent membranes, caesarean section, and anemia. In etiology finding urinary tract infection 15.33% was most common cause followed by 12.6% pain in breast or breast engorgement, 6% cases of pneumonia, 10% endometritis, 8.6% had wound infection,12% cases were septicemia ,4% perineal tear. Majority 60% of cases had no severe complication, 12% were septicemia, 4% landed in to disseminate intravascular coagulation and 4% maternal death. **Conclusion:** Puerperal pyrexia is an escapable and manageable problem; however prevention, timely acknowledgement, early intervention and treatment of underlying cause is the way to avoid maternal morbidity and mortality. Endorsement of universal aseptic technique for patient will certainly reduce the burden of puerperal pyrexia.

Keywords: Puerperal pyrexia, risk factors, complication, maternal outcome.

Puerperium is a phase in life of female when great diligence is required for both mother and new born. Majority of the alarming complications arise immediately following delivery. Puerperal pyrexia and sepsis are among the leading causes of preventable maternal mortality and morbidity.[1]

Puerperium refers to the six weeks period following childbirth during which anatomical and physiological changes restore the women to pre-pregnant state.

Some women however may face unexpected complications in Puerperium. Some may have emergency needing prompt attention and treatment, these occur mostly within 24 hours of childbirth. Most of the other problems occur in the first week but some may be delayed up to 2-3 weeks. [2]

Nowadays, despite scientific and technological advances in different areas, puerperal infections remain a big problem, due to its prevalence, morbidity and lethality. WHO claims infection to be primary cause of 15% maternal mortality. It causes at least 75,000 maternal deaths worldwide per year. Deaths related to puerperal infections are very rare in the industrialized world. It is estimated 3 in 100,000 birth results in maternal death due to infection. However, the death rate in developing nations may be 100 times higher [3]. The study is important looking on to the contribution of puerperal pyrexia

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to maternal morbidity and mortality.

The aim of this study was to find out the incidence of puerperal pyrexia, probable etiology, role of risk factors and evaluate the maternal outcome in case of puerperal pyrexia.

Materials and methods

The present study was a prospective hospital based observational study, carried out in the department of Obstetrics and Gynaecology at Netaji Subhash Chandra Bose Medical College and Hospital Jabalpur (Madhya Pradesh) from 1st March 2019 to 31 August 2020. As per reported incidence of puerperal pyrexia in the literature is 6.28% in Indian population, we have screened 3000 deliveries in the study.

We included all cases admitted and delivered (>28 week of gestation and < 42 days of delivery) in our center. Patients who delivered outside our hospital were not included in our study.

Prior informed consent was obtained before evaluating each patient. The data included the detailed history and clinical examination with all relevant laboratory investigation. The variables included were age, parity, occupation, socioeconomic status, booking status, labour characteristics like duration and onset of labour, status of membrane at admission, number of vaginal examination, mode of labour, hygienic condition.

All patients were evaluated for occurrence of complication like puerperal pyrexia, abdominal distention, foul smelling lochia, breast abscess and mastitis, episiotomy infection and gaping, cesarean wound infection and gaping, urinary tract infection, other complication like peritonitis, puerperal psychosis, post partum depression and deep vein thrombosis.

Results

During the study period 167 out of 3000 patients had developed puerperal pyrexia. The incidence of puerperal pyrexia is 5.57 per thousand deliveries. In earlier study conducted in Indian population the incidence of puerperal pyrexia is reported 6.28 per 1000 deliveries. This study reflected that though puerperal pyrexia is less in developed countries, it is still a cumbersome problem affecting maternal morbidity and mortality in developing countries.

Most of the women 70.7% aged between 20-30 years had primary education 48.7% and 61.3% were housewife. Majority of women 74.7% were unbooked and 63.3% from rural area. Most of the cases 78.7% were referred from periphery. Maximum numbers of affected patient 67.3% were primigravida (table 1).

Most women 61.3% had prolonged labour, 54.6% cases had more than 4 vaginal examination. Spontaneous onset of labour was seen in 64% of patient whereas 36% patient labour was induced. At the time of admission 68.7% patient had absent membranes and history of leaking per vagina. Out of 150 cases 70% patient underwent caesarean section, 26% vaginally and 4% had instrumental vaginal delivery (table 2).

Table 1: General characteristic of patients

Characteristic	Number of patient	Percentage (%)
Age (years)		
Less than 20	17	11.3
20 – 30	106	70.7
More than 30	27	18
Education		
No formal education	5	3.3
Primary school	73	48.7
Middle school	49	32.7
High school	23	15.3
Booking status		
Booked	38	25.3
Unbooked	112	74.7
Admission status		
Direct	32	21.3
Referred	118	78.7
Parity		
Primi	101	67.3
Para (1-4)	39	26
Para 5 and above	10	6.7

Table 2: **Obstetrics status of patients**

Duration of labour	Number of patient	Percentage(%)
Less than 12 hours	58	38.7
More than 12hours	92	61.3
No. of vaginal examination		
4 or less than 4	144	45.4
More than 4	6	54.6
Status of membranes at admission		
Intact	47	31.3
Absent	103	68.7
Mode of Labour		
Vaginal	39	26
Instrumental vaginal	6	4
Caesarean section	105	70
Maternal hemoglobin		
<5 gm%	25	16.7
6 gm% - 8gm%	91	60.7
>9 gm%	34	22.7
TLC Count (cumm)		
7000 – 11000	38	25.3
> 11000	112	74.7
Microbial isolates		
E. Coli	22	14.6
Klebsiella species	7	4.6
Multiple negative bacilli	4	2.6
Staphylococcus aureus	3	2
No growth	114	76.2

Most of the patients 60.7% were anemic with haemoglobin level between 6 gm% to 8 gm% while 22.7% had haemoglobin level more than 9 gm% and 16.7% patient were having haemoglobin level less than 5 gm% (table 2). Total leukocyte count was found to be more than 11000/cumm in 74.7% patients. High vaginal swab culture and sensitivity report 76.2% revealed no growth in culture report, 14.6% cases had E. coli, 4.6% Klebsiella species, 2.6% had multiple gram negative bacilli and 2% had Staphylococcus in growth culture (table 2).

Table 3: **Etiology of puerperal pyrexia**

Etiology	Total no. of cases	Percentage (%)
Urinary tract infection	23	15.3
Pain in breast/breast engorgement	19	12.6
Pneumonia	9	6
Endometritis	15	10
Wound infection	13	8.6
Septicemia	18	12
Perineal tear infection	6	4
Malaria	4	2.6
Dengue	2	1.3
Chikungunya	2	1.3
Scrubtyphus	3	2
Hepatitis	1	0.6
Retained product of conception	4	2.6
No specific cause	31	20.6

In etiological finding urinary tract infection 15.33% was most common cause followed by 12.6% pain in breast or breast engorgement, 6% cases of pneumonia, 10% endometritis, 8.6% had wound infection, 12% cases had septicemia, 4% perineal tear, 2.6% cases had retain product of conception, 2.6% had malaria, 1.3% dengue, 1.3% cases chikungunya, 2% had scrub typhus, 2% were hepatitis and in 20.6% cases no cause of puerperal pyrexia was seen (table 3).

Table 4: Complications

Complications	Number of patient	Percentage (%)
Disseminated intravascular coagulation	6	4
Septicemia	18	12
Death	6	4

Among 150 cases, majority 80% had no severe complication, 12% had septicemia, 4% landed in to disseminate intravascular coagulation and 4% maternal death (table 4). Perinatal outcome in study 83.3% were live born and discharged, 11.3% early neonatal death and 8% had still birth.

Discussion

Puerperium is a time when extra care for both mother and the newborn is required. It is an aspect of maternity care that has received less attention compared with pregnancy and delivery.

In our study puerperal pyrexia was common in women aged between 20-30 years (70.7%) and educated till primary school (48.7%). Similarly Infunanya NJ et al[4] 2019, reported maximum number of cases (40.4%) in age group 27-32 years and no formal education in 49.8%. Likewise in study of Ngunyi et al [5] 2020, they had included 134 cases of puerperal pyrexia and maximum number of cases (83%) were under 20 - 34 years of age group. In this study 50% belonged to upper lower class as per modified Kuppuswamy SES classification. In the study reported by Sheeba et al 2017 [6], 46% were lower class, 39% from upper lower class. In most of the developing countries there are a large number of women suffer from infective complication, due to poverty, malnutrition and illiteracy. These women do not seek for routine antenatal visit.

In our study 74.4% patients were unbooked, 78.7% cases were referred from periphery and 21.3% were direct admission. Our tertiary centre is in outskirt of city and it mostly caters the high risk referred cases. The study conducted by Pahula Verma et al [7] 2016, also reported 76% cases were referred from periphery and 24% as direct admission. Most of the patients (67.3%) were primigravida. Study carried out by Kumari A et al [8] showed 40% primipara. Maximum patients 61.3% had prolonged labour (more than 12 hours). Study by Infunnanya NJ et al[4] also had 71.9% patient had duration of labour more than 12 hours.

In this study 54.6% cases had more than 4 vaginal examination and 45.4% were 4 or less vaginal examination in the study. By Joseph et al [9], 89% cases had 4 or less than 4 vaginal examination and 11% had more than 4 vaginal examination. The finding of this study showed that most of the women were referred undelivered cases from home by traditional birth attendants where they may have had multiple unsterile vaginal examinations.

Present study showed, majority 64% had spontaneous onset of labour and 36% cases had induced labour. Study of Infunanya NJ et al [4] had 87.19 % spontaneous onset of labour and 12.81% had induced labour.

In this study majority 68.7% came with absent membrane at admission and 31.3% with intact membranes. Comparable to Infunanya NJ et al [4], 78.33% cases were with membranes absent and 21.67% intact membranes making them prone for chorioamnionitis and puerperal pyrexia subsequently. In these women, second stage of labour was prolonged, so the rate of second stage intervention by caesarean section (70%) as well as instrumental delivery (4%) was high, this increase rate of caesarean section may be also due to mother reporting with multiple high risk factors, reaching after 2nd and 3rd referrals. In study of Sharma SS et al[10], 40.66% were LSCS, 31.34% vaginal delivery with episiotomy and 28% vaginal delivered. Comparable study of Ifunanya NJ et al [4], showed 55.67% were LSCS, 40.39% spontaneous vaginal delivery and 3.94% instrument vaginal delivery.

In laboratory finding 16.7% were less than 5gm% haemoglobin, 60.7% were haemoglobin level between 6gm% to 8gm% and 22.7% having more than 9gm% haemoglobin. Anemia was widely known and significant risk factor for puerperal pyrexia. Pradhan B et al[11], in their study showed 54.1% had hemoglobin less than 10 gm% and 45.9% cases were hemoglobin more than 10gm%. In our study majority of women 74.7% had more than 11000 cumm TLC and 25.3% had TLC count between 7000- 11000 cumm. The same is reported by Pahula Verma et al [7].

In present study among 150 cases majority of cases, 76.2% revealed no growth in culture report, 14.6% had E. coli, 4.6% Klebsiella species, 2.6% were multiple gram negative bacilli, 2% had Staphylococcus aureus in culture. No growth in culture report may be due to overburdening to laboratory and decrease manpower, machine and thus sub standard service but knowledge of culture and sensitivity of organisms is a must for guidance of antibiotics, so that treatment is cost effective and better. In the study of Kaur T et al [12], in their study 36% cases had Staphylococcus aureus and 24.8% had E. coli, 21.8% had Pseudomonas growth, 18.6% Klebsiella, 14.4% Acinetobactor and 24.5 % had mixed microorganisms in culture.

Urinary tract infection was the commonest (15.33%) cause of puerperal pyrexia in this study. Other causes included 12.6% pain in breast or breast engorgement, 6% cases of pneumonia, 10% endometritis, 8.6% had wound infection, 12% cases were septicemia, 4% perineal wound infection, 2.6% had malaria,1.3% were dengue, 1.3% cases chikungunya, 2% had scrub typhus, 0.6% were hepatitis, 2.6% cases had retain product of conception as the cause of puerperal pyrexia. And in 20.6% cases no cause of puerperal pyrexia detected positive. Infective morbidity is still a huge road block in health of women in developing country. Comparable study by Sharma SS et al[10], had 150 cases of which 30 % were mastitis/breast abscess, 24% urinary tract infection, 12% had puerperal sepsis and 7% were malaria. Most common cause of puerperal pyrexia in our study is urinary tract infection (this may be attributed to preexisting undiagnosed UTI or improper asepsis during catheterization) followed by pain in breast or breast engorgement, endometritis, wound infection. Risk factors for women who developed bacteriuria were primipara, cesarean delivery, perineal laceration, operative vaginal delivery, catheterization and prolonged labour. Difficulties in breastfeeding, cracked nipples were also contributory factors in to developing fever in puerperium period.

The route of delivery is significant risk factor for development of uterine infection. Risk increases with prolong membrane rupture, prolong labor and multiple vaginal examination, wound infection, obesity, diabetes, corticosteroid therapy, immunosupression, anemia, hypertension and inadequate heamostasis with hematoma formation.

Among 150 cases of our study majority 80% had no severe complication, 12% were septicemia, 4% landed in to disseminate intravascular coagulation and 4% maternal death. This rate of morbidity and mortality may be because of delay in referral, delay in arrival time to tertiary centre with increased operational intervention in such already set in sepsis in these women. Similar study by Khaskheli MN et al[13], reported 27.3% septicemia, 17.8% had disseminated intravascular coagulation and 8.5% cases succumbed.

Awareness regarding nutrition and antenatal care always had a back seat. Typical problems associated with infection control in developing countries are inadequate aseptic technique, substandard antibiotics, and poor laboratory facilities, subprime designs of construction of buildings and negligible water and sanitation system, overburdening of facilities and insufficient number of manpower.

Conclusion

Puerperal pyrexia can deteriorate fast and result in adverse maternal outcome if not dealt promptly. It is an escapable and manageable problem; however prevention, timely acknowledgement, early intervention and treatment of underlying cause is the way to avoid maternal morbidity and mortality associated with it. The risk factor were mostly related to perinatal events like anemia, absent of membrane, prolonged labour, number of vaginal examination, catheterization, cesarean section etc so these identified factors become predominant to be taken care of. Endorsement of universal aseptic technique for patient will certainly reduce the burden of puerperal pyrexia. If mother is healthy every home, society and nation is healthy.

Conflict of interest: None. **Disclaimer:** Nil.

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