

# A Clinical and Microbiological Study of Puerperal Sepsis.

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Received: May 2018

Accepted: June 2018

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## ABSTRACT

**Background:** According to The World Health Organization (WHO), puerperal sepsis is defined as the infection of the genital tract occurring at labor or within 42 days of the postpartum period. The patients of puerperal sepsis usually present with fever, abdominal pain and vaginal discharge. Early diagnosis and proper antibiotic treatment is essential. Delay in diagnosis and treatment may land the patient into septic shock, hypotension and multiorgan dysfunction. Blood culture and sensitivity is necessary for guiding the antibiotic therapy. **Methods:** This was a prospective study comprising of 40 patients who were admitted with a presumptive diagnosis of puerperal sepsis. Patient were enrolled in this study on the basis of a predefined inclusion and exclusion criteria. Detailed history and appropriate clinical examination was done in all cases. Investigations like complete blood count, CRP, Bleeding time, clotting time and prothrombin time was done in all cases. Blood culture and sensitivity was done and imaging was done on the basis of symptomatology. Patients demographic details, clinical profile, signs and symptoms, organisms involved and outcome of management was studied in detail. Data was analyzed using SSPE 16.0 software. **Result:** Out of 40 studied cases majority of the patients were referred from other hospitals (70%) and were multigravida (56.67%). Mean age of the patients was found to be 25.37+/- 5.86 years. Most of the patients were delivered by normal vaginal delivery in private clinics of rural areas (16/40). The presenting complaints of majority of the patients included Fever (80%), Abdominal Pain (60%), respiratory symptoms (15%), Vaginal Discharge (7.5%), Urinary complaints (7.5%) and bleeding PV (5%). 3 patients (7.5%) presented in shock. 3 patients presented with septic shock. The most common pathogen isolated on the basis of blood culture was found to be Klebsiella (25%) followed by Staph Epidermidis (15%). 38 (95%) patients recovered completely while 2 (5%) patients expired. **Conclusion:** Puerperal sepsis is one of the common causes of morbidity in postpartum period. Early diagnosis and prompt management is necessary in these cases to prevent morbidity and mortality.

**Keywords:** Caesarean Section, Vaginal Birth.

## INTRODUCTION

According to The World Health Organization (WHO), puerperal sepsis is defined as the infection of the genital tract occurring at labor or within 42 days of the postpartum period.<sup>[1]</sup> Amongst the causes of such fever common are Local spread of bacteria, postsurgical wound infections, cellulitis, respirator complications of anesthesia, retained products of conception, urinary tract infections and septic pelvic phlebitis. The common risk factors which may predispose a patient for development of puerperal sepsis include premature rupture of membranes, anemia, cesarean section and lower socioeconomic status.<sup>[2]</sup> In cases of cesarean section infections such as endometritis are caused by bacteria found around the incision, perineum and vagina. Administration of antibiotics before, during and after cesarean section has dramatically reduced the incidence of puerperal sepsis. Puerperal sepsis is more common after

cesarean section as compared to after normal vaginal delivery. Though early diagnosis and prompt antibiotic treatment is associated with eradication of infection delayed diagnosis may be associated with complications such as uterine synechia, scarring, secondary infertility, septic show and in some untreated cases puerperal sepsis may even prove fatal.<sup>[3]</sup>

A detailed history specially the mode of delivery, history of premature rupture of membranes, history of fever and antibiotics intake should all be noted. A systematic clinical examination should be carried out and any wound infection should be noted. The common symptoms associated with puerperal sepsis include fever, vaginal discharge, chills and symptoms related to urinary tract infection (burning micturition, dysuria and increased frequency), respiratory tract (cough, fever and breathlessness) and genitourinary tract (abdominal pain and foul-smelling discharge). The signs may include fever, vaginal discharge, respiratory signs (tachypnea, rales and rhonchi) and tachycardia.<sup>[4]</sup> Abdominal pain associated with puerperal sepsis initially may be confused with postpartum abdominal pain and hence a high index of suspicion is necessary on the part of

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treating obstetrician for early diagnosis and prompt antibiotics treatment. The workup of patients clinically suspected to be having puerperal sepsis include complete blood count, C-Reactive Proteins, blood culture and sensitivity, urine routine as well as culture and sensitivity and coagulation studies like bleeding time, clotting time and prothrombin time.<sup>[5]</sup> Imaging studies may be required depending upon the suspected diagnosis. Ultrasound is an excellent and easily available tool for the diagnosis of conditions such as retained products of conception, pelvic abscess and hematoma. Contrast enhanced CT may be required for the diagnosis of conditions such as pelvic thrombosis. Magnetic resonance imaging may give excellent diagnosis of soft tissue in cases of abscess.<sup>[6]</sup>

Once the diagnosis is confirmed then the management is pretty straight forward. All patients suspected to be having puerperal sepsis must be treated by adequate antibiotics treatment. Administration of antibiotics should not be withheld while waiting for culture sensitivity reports rather empirical broad-spectrum antibiotics must be started and later antibiotics can be switched depending upon sensitivity reports. Specific diagnosis like retained product of conception, pelvic hematoma or abscess will need specific treatment in addition to antibiotics.<sup>[7]</sup> In seriously ill patients intensive care, fluid management, oxygen supplementation and management of septic shock is of critical importance.<sup>[8]</sup> This study was conducted to understand clinical presentation and microbiological profile of the infecting organisms in cases of puerperal sepsis.

## MATERIALS AND METHODS

The present study was a prospective cohort study conducted in the department of obstetrics and gynecology in a tertiary care center. 40 women who were diagnosed to be having puerperal sepsis according to WHO criteria were included in this study. Patients who have delivered in our hospital as well as those delivered in other health centers as well as patients with home delivery were also include in this study. Demographic details were noted in all the cases. Detailed history about antenatal visit, natal history, type of delivery and postpartum history was recorded. History of fever and associated complaints was also noted down. Complete blood count, C-Reactive protein levels, bleeding time, clotting time, prothrombin time and urine examination was done in all cases. Blood culture and sensitivity was done in all cases. Imaging was done depending upon indications. All laboratory methods followed standard protocols. Patients were treated by supportive care, intravenous antibiotics on the basis of culture sensitivity reports. In seriously ill patients supportive and intensive care was also provided. Data was analyzed using SSPE 16.0 software.

### Inclusion criteria

Any woman presenting within 42 days of delivery or miscarriage with fever, abdominal pain, foul smelling discharge, abdominal distention, pelvic abscess, peritonitis and/or shock.

Patients who gave informed consent.

### Exclusion criteria

Patients presenting after 42 hours of delivery.

Those who refused consent.

Those patients in whom cause of fever was found to be other than puerperal sepsis.

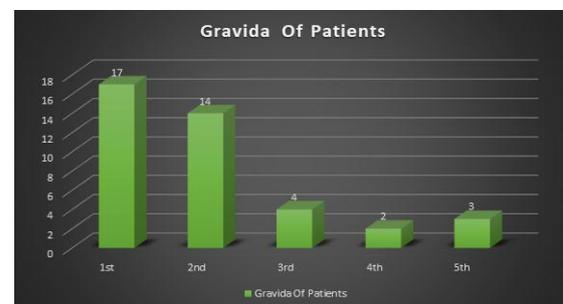
## RESULTS

This was a prospective study of 40 pregnant women diagnosed with puerperal sepsis on the basis of WHO criteria. Amongst the studied cases 12 (30 %) patients were those who came for follow up while remaining 28 (70 %) patients were referred to our hospital from other hospitals in view of fever, abdominal pain or vaginal discharge.

**Table 1: Referred Vs Follow up cases in the study.**

Type of cases	No Of Cases	Percentage
Referred	28	70 %
Follow Up	12	30 %
Total	40	100 %

Amongst the studied cases 17 (56.67%) patients were primigravida while rest of the patients were multigravida (43.33%).



**Figure 1: Gravida of the studied cases.**

The analysis of the age groups of the studied cases showed that the most common age group of the affected cases was 18-25 years (43.33%) followed by 26-30 years (40%). Only 10 (16.67%) patients belonged to age group of more than 30 years. Mean age of the patients was found to be 25.37+/- 5.86 years.

**Table 2: Age group of the studied cases.**

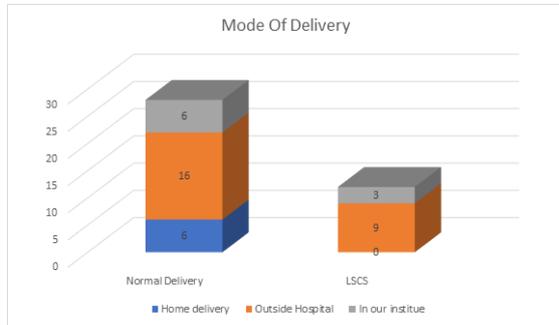
Age groups	No. of Patients	Percentage
18 - 25 years	19	47.50%
26 - 30 years	12	30.00%
31 - 35 years	7	17.50%
> 35 years	2	5.00%
Total	40	100.00%

Mean Age  $\pm$  SD = 25.37+/- 5.86 years.

The analysis of mode of delivery showed that most of the patients were delivered by normal vaginal

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delivery in private clinics of rural areas (16/40). 12 patients have undergone cesarean section out of which 9 LSCS were done in outside hospitals and patients then were referred for work up of puerperal sepsis. 6 (15%) patients has delivered by normal vaginal deliveries in this hospital while 6 patients had history of home delivery.



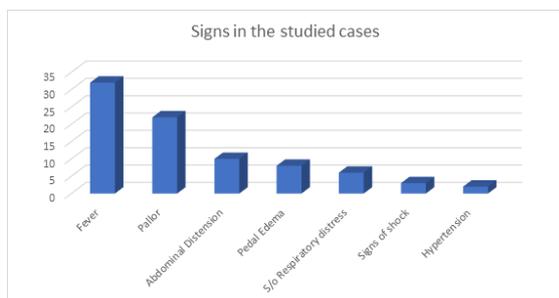
**Figure 2: Mode of delivery in the studied cases.**

The presenting complaints of majority of the patients included Fever (80%), Abdominal Pain (60%), respiratory symptoms (15%), Vaginal Discharge (7.5%), Urinary complaints (7.5%) and bleeding PV (5%). 3 patients (7.5%) presented in shock.

**Table 3: Presenting symptoms of the studied cases.**

Symptoms	No Of Patients	Percentage
Fever	32	80.00%
Abdominal Pain	24	60.00%
Respiratory Symptoms	6	15.00%
Vaginal Discharge	3	7.50%
Urinary Complaints	3	7.50%
Bleeding PV	2	5.00%
Shock	3	7.50%

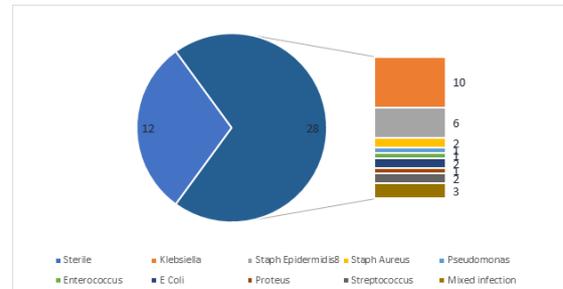
On clinical Examination 32 (80%) patients were found to have fever. Pallor was present in 22 patients (55%) while abdominal distension and pedal edema was present in 10 (25%) and 8 (20%) patients respectively. Signs of respiratory distress was present in the form of tachypnea and subcostal retractions in 6 (15%) patients. Signs of shock like hypotension, tachycardia and feeble pulses were present in 3 (7.50%) patients. 2 (5%) patients had hypertension at the time of presentation.



**Figure 3: Presenting Signs in the studied cases.**

The analysis of blood culture reports showed that out of 40 cases blood culture was found to be sterile in

12 (30%) cases. The most common pathogen isolated on the basis of blood culture was found to be Klebsiella (25%) followed by Staph Epidermidis (15%). The other organisms isolated on blood culture were Staph Aureus (5%), E coli (5%), streptococcus (5%). Pseudomonas, enterococcus and proteus were isolated in 1 patient (2.5%) each. Multiple organisms suggestive of mixed infection were isolated from 3 (7.5%) patients.



**Figure 4: Organisms isolated by blood culture and sensitivity.**

All patients were treated by broad spectrum antibiotics from the time of admission and later antibiotics were changed on the basis of culture and sensitivity reports. Out of 40 studied cases 38 patients (95%) patients were recovered. Out of the 3 patients who presented to the hospital in profound septic shock 2 patients expired emphasizing the importance of early diagnosis and prompt management of any patient presenting with fever in puerperal period.

## DISCUSSION

Puerperal sepsis is one of the important causes of morbidity in postpartum period. If not treated in time it may cause septic shock and eventually may prove to be fatal. In our study puerperal sepsis was seen more commonly after the normal vaginal delivery. This may be due to that fact that some of these normal vaginal deliveries were home deliveries. Many authors have reported that home deliveries conducted by untrained personnel is one of the most important and preventable cause of puerperal sepsis. Maharaj D et al in their study of puerperal sepsis found that unhygienic home deliveries along with low socioeconomic status, poor nutrition, primiparity, anemia, prolonged rupture of membranes, prolonged labor, multiple vaginal examinations in labor, cesarean section, obstetrical maneuvers, retained secundines within the uterus and postpartum hemorrhage were some of the common risk factors for development of puerperal sepsis.<sup>[9]</sup> Similar findings were reported by Marwah S et al and Ahmed MI et al in their studies.<sup>[10,11]</sup>

In our study 30% of the patients developing puerperal sepsis had delivered by cesarean section. This was a significant finding in our study because patients usually receive parenteral antibiotics before

and after cesarean section. In a large study conducted by Brumfield CG et al it was found that out of 1643 patients who had undergone cesarean sections for various indications 322 (20%) developed puerperal sepsis.<sup>[12]</sup> Endometritis was diagnosed as a persistent fever  $>$  or  $=100.4$  degrees F beyond 24 hours after cesarean delivery and one or more of the following: uterine tenderness, tachycardia, foul lochia, or leukocytosis. Antibiotic therapy included gentamicin plus clindamycin and ampicillin (or vancomycin) as a triple antimicrobial in 148 women. Similarly Sivan Suarez-Easton et al reported the prevalence of Post cesarean wound infection to be 3-15%. May of these patients may eventually land into puerperal sepsis.<sup>[13]</sup>

In our study most, common sign of puerperal sepsis was found to be fever (80%) followed by Abdominal Pain (60%), respiratory symptoms (15%), Vaginal Discharge (7.5%), Urinary complaints (7.5%) and bleeding PV (5%). 3 patients (7.5%) presented in shock. Khaskheli MN et al in their study of 129 patients with puerperal sepsis reported that the common presenting symptoms were fever in 117 (90.69%) women,<sup>[14]</sup> wound infection in 51 (39.53%) women, and abdominal distention in 28 (21.70%) women, majority of these women were hospitalized for more than 10 days 109 (85.82%). Common morbidities seen were disseminated intravascular coagulation in 23 (17.82%) women and septicemia in 35 (27.13%) women. It is worth emphasizing here that all cases in puerperal period are not due to puerperal sepsis and whenever necessary an alternative diagnosis should also be ruled out. Alexander Joe in his study of 219 cases who were initially labelled to be having puerperal sepsis found that out of these cases 71 were local uterine infections,<sup>[15]</sup> 47, pelvic or general peritonitis; 11, pelvic cellulitis; 20, septicemia or pyemia; 12, pyelitis, and 58, febrile conditions not due to infection of the genital tract.

Finally, out of 40 cases 2 (5%) expired despite intensive care. These 2 patients were out of the 3 patients who presented with shock and hypotension thus an important aspect of management of puerperal sepsis is early diagnosis and prompt antibiotic treatment. Delay in the diagnosis may prove fatal.

## CONCLUSION

Puerperal sepsis is one of the common causes of postpartum morbidity. Its early diagnosis and proper treatment is essential. Delay in the diagnosis may increase morbidity and eventually may prove fatal.

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**How to cite this article:** Gopchade CA. A Clinical and Microbiological Study of Puerperal Sepsis. Ann. Int. Med. Den. Res. 2018; 4(4):OG31-OG34.

**Source of Support:** Nil, **Conflict of Interest:** None declared