

# PUERPERAL SEPSIS IN WOMEN: FREQUENCY AND RISK FACTORS: AN EXPERIENCE AT TERTIARY LEVEL HOSPITAL

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## Abstract

**Background:** Puerperal sepsis remains a significant contributor to maternal morbidity and mortality, particularly in low-resource settings. Despite advancements in maternal care, factors such as inadequate prenatal care, anemia, prolonged labor, and cesarean deliveries increase susceptibility. This study explores the frequency and risk factors of puerperal sepsis in a tertiary care hospital, highlighting critical areas for intervention to improve maternal health outcomes.

**Objective:** To assess the frequency and risk factors of puerperal sepsis.

**Materials and Methods:** A cross sectional study was conducted at department of gynecology, Lady Reading Hospital, Peshawar from January 2023 to February 2024, on 157 patients who delivered within 42 days. We determined the frequency and risk factors of puerperal sepsis. We did not include patients with malaria, dengue fever or typhoid. Chi Square test was used for assessing association.

**Results:** The mean age of participants was 29.36±6.38 years, with a puerperal sepsis frequency of 9.6%. Significant risk factors included cesarean delivery (60%), bacterial infection (93.3%), anemia (86.7%), postpartum hemorrhage (80%), prolonged labor (53.3%), uncooked status (73.3%), and rural residence (80%), all showing notable associations ( $p < 0.05$ ).

**Conclusion:** The study highlights that puerperal sepsis remains a significant concern, influenced by modifiable risk factors such as anemia, uncooked status, and rural residence. Strengthening antenatal care, improving postpartum monitoring, and addressing systemic gaps in maternal healthcare can reduce its burden and improve outcomes.

**Keywords:** Puerperal sepsis, Risk factors, Frequency, Infection

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## Introduction

Childbirth is widely recognized as a transformative experience that brings happiness<sup>1</sup>. However, it can also be a challenging time that introduces new issues such as puerperal sepsis<sup>2</sup>. Puerperal sepsis, commonly referred to as postpartum infection, is a major contributor to maternal illness and death globally, especially in areas with limited resources. Throughout history, it has been a frequent complication of pregnancy that is linked to obstetric shock including maternal mortality<sup>3,4</sup>. Nigeria has a rate of maternal mortality of 512 per 100,000 live births, which is one of the most severe rates of

maternal mortality in the world<sup>5</sup>. Pre-eclampsia, obstetric hemorrhage, and puerperal sepsis were the three main causes of maternal mortality and morbidity<sup>6,7</sup>. Every year, there are more than 5 million instances of puerperal sepsis worldwide, resulting in approximately 75,000 deaths of mothers. In low-income countries, the mortality rate due to sepsis is reported to be 33%<sup>8</sup>.

Approximately 60% of maternal fatalities transpire during the process of childbirth and the early aftermath<sup>9</sup>. In Pakistan, the mortality rate caused by pregnancy and delivery problems is one fatality every

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40 minutes<sup>10</sup>. The Pakistan Demographic Health Survey identified sepsis as the third leading cause of maternal mortality in Pakistan<sup>11</sup>. Sepsis is influenced by various distant, intermediate, and proximal risk factors. Distant and intermediate factors are determinants that increase women's susceptibility or predisposition to acquire sepsis<sup>12</sup>.

A study recorded the risk factors such as home delivery, gestational diabetes, preterm delivery, lower abdominal pain, vaginal discharge, and blood glucose<sup>13</sup>. However, puerperal sepsis can be prevented by following established protocols for antenatal care, maintaining aseptic delivery methods, and providing appropriate postpartum care<sup>14</sup>. Puerperal sepsis is diagnosed by evaluating the patient's clinical symptoms and signs, together with doing laboratory testing including a complete blood count, blood culture, and vaginal swabs to determine the specific organisms responsible for the infection<sup>15</sup>.

Early detection of sepsis is crucial as its advancement can be fatal, and timely identification can aid in minimizing additional problems. The objective of the study establishes the frequency and risk factors associated with puerperal sepsis in women delivered at lady reading hospital Peshawar.

## Material and Method:

**Study Design:** The study was conducted as a cross-sectional analysis

**Study Setting:** Department of Gynecology, Lady Reading Hospital, Peshawar,

**Study Duration:** From January 2023 To February 2024,

**Ethical Approval:** Ethical Clearance from the Hospital.

**Inclusion Criteria:** A total of 157 admitted patients who had delivered within 42 days were included and included those aged 18 to 40 years with a gestational age at admission of  $\geq 37$  weeks. The sampling frame included all postpartum patients admitted to the hospital during the study period who met the inclusion criteria.

**Exclusion Criteria:** Women with malaria, typhoid, or dengue fever were excluded

**Sample Size:** size was determined using Open Epi, with a previous frequency of puerperal sepsis at 11.5%<sup>6</sup>, an absolute precision of 5%, and a confidence interval of 95%.

**Sampling Technique:** Patients were selected through random sampling.

**Procedure:** Puerperal sepsis was assessed based on clinical signs such as pelvic pain, fever (temperature  $\geq 38.5^{\circ}\text{C}$  on any occasion), unusual vaginal discharge, and delayed uterine involution.

This condition was defined as an infection of the genital tract occurring between rupture of membranes or labor and 42 days postpartum. Demographic and clinical data were collected, including anemia (hemoglobin  $<12.0$  g/dL), bacterial infection (confirmed via laboratory results), booking status, prolonged labor ( $>20$  hours), residence status, postpartum hemorrhage, diabetes (HbA1c  $>6.5\%$ ), and mode of delivery.

**Statistical Analysis:** Data analysis was performed using SPSS 24. The Chi-Square or Fisher Exact Test was applied to assess associations, with a significance level set at  $p < 0.05$ .

## Results:

Mean age was  $29.36 \pm 6.38$  years. In our study 44 (28%) patients were primiparas while 113 (72%) had parity 2 to 5. Diabetes was found in 3 (1.9%) patients. Figure 1 presents the mode of delivery of our patients, majority of the patients had vaginal delivery 83 (52.9%). Bacterial infection was found in 81 (51.6%) patients. Frequency of anemia was 91 (58%). Postpartum hemorrhage was 29 (18.5%). Prolonged labour was experienced by 45 (28.7%) patients. Residence status showed that 76 (48.4%) patients were from urban while 81 (51.6%) were from rural areas.

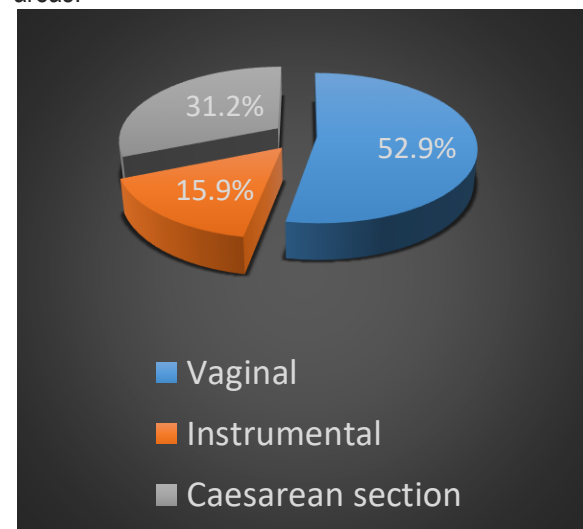


Figure 1: Mode of delivery

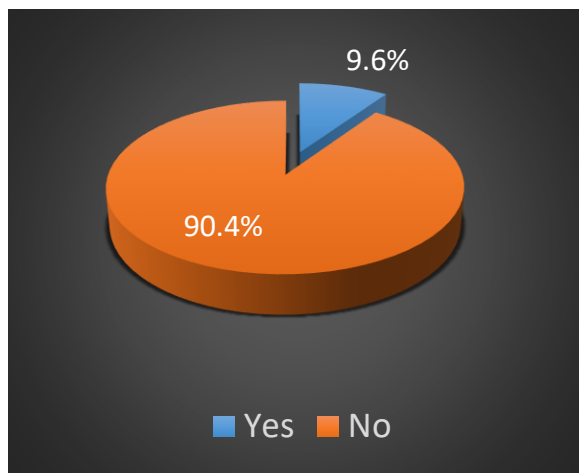


Figure 2: Frequency of puerperal sepsis

Table 1: Risk factors for puerperal sepsis

Risk factors		Puerperal sepsis				P value
		Yes		No		
		N	%	N	%	
Mode of delivery	Vaginal	3	20.0%	80	56.3%	0.01
	Instrumental	3	20.0%	22	15.5%	
	Caesarean section	9	60.0%	40	28.2%	
Bacterial infection	Yes	14	93.3%	67	47.2%	0.001
	No	1	6.7%	75	52.8%	
Anemia	Yes	13	86.7%	78	54.9%	0.01
	No	2	13.3%	64	45.1%	
Postpartum haemorrhage	Yes	12	80.0%	17	12.0%	0.0001
	No	3	20.0%	125	88.0%	
Prolonged labour (>20 hours)	Yes	8	53.3%	37	26.1%	0.02
	No	7	46.7%	105	73.9%	
Booking status	Booked	11	73.3%	18	12.7%	0.0001
	Unbooked	4	26.7%	124	87.3%	
Residence	Urban	3	20.0%	73	51.4%	0.02
	Rural	12	80.0%	69	48.6%	

## Discussion:

Puerperal sepsis, also known as postpartum sepsis, is a serious infection that typically manifests as fever and systemic symptoms following childbirth. With a number of variables leading to its development, this illness poses a serious risk to the health of mothers. It is essential to comprehend these risk factors in order to successfully avoid and manage puerperal sepsis. The frequency of puerperal sepsis in our study turned out to be 15 (9.6%). Kajeguka DC et al<sup>16</sup> reported that the frequency of puerperal sepsis in their study was 11.5%. BwanaVMet al<sup>17</sup> reported that puerperal sepsis in their study was 16.7%. The differences may be attributed to variations in healthcare access, preventive practices, and socioeconomic factors across regions. These disparities highlight the

influence of local healthcare systems and resource availability on maternal outcomes.

Compared to vaginal births, caesarean deliveries are linked to an increased prevalence of postpartum infections<sup>18</sup>. In our study we observed notable association of caesarean section with puerperal sepsis, patients who delivered via caesarean section showed higher frequency of puerperal sepsis. Kajeguka DC et al<sup>16</sup> in their study also reported similar findings. In contrast to our findings Khaskheli MN et al<sup>19</sup> reported that patients who had vaginal delivery were at higher risk of puerperal sepsis.

A woman is more vulnerable to sepsis when she has significant blood loss because her body is less able to fend off infections<sup>20</sup>. Our results exhibited that patients having postpartum hemorrhage had higher frequency of puerperal sepsis. Kajeguka DC et al<sup>16</sup>

and Khaskheli MN et al<sup>19</sup> also reported that patients with PPH had higher prevalence of puerperal sepsis. We found that Puerperal sepsis as also significantly linked to women in uncooked cases, which is defined as those who do not get enough prenatal care or do not make the required antenatal appointments. Inadequate prenatal care might leave women vulnerable to infections due to untreated or undermanaged medical issues. Olutoye AS et al<sup>21</sup> reported similar findings, they reported that 93.4% uncooked patients had puerperal sepsis. Puerperal sepsis develops primarily as a result of bacterial infections. These infections can originate from the vaginal tract of the mother, environmental pollutants, or microorganisms linked to healthcare facilities, among other places. The physiological changes and possible abnormalities in typical protective barriers during the postpartum period make the postpartum period especially susceptible to infections.<sup>22</sup> We also found that bacterial infection was highly notable in patients with puerperal sepsis. Puerperal sepsis is also more common in patients who live in rural settings. Patients in rural areas may have particular difficulties, such as restricted access to medical services and facilities. These obstacles may result in a lack of prenatal visits, a delay in obtaining care, and ineffective handling of issues. In our study 81 (51.6%) patients belonged to the rural areas, these patients showed higher frequency of puerperal sepsis than patients from urban areas. Anemia and prolonged labor were also identified as major risk factors for puerperal sepsis in our study, as they showed notable association with puerperal infection, our findings are in accordance with Olutoye AS et al<sup>21</sup>, they reported anemia as the most common complication of puerperal sepsis. Demises GA et al<sup>23</sup> reported that patients who had prolonged labor were notably at higher risk of developing puerperal infection.

## Conclusion:

The frequency of puerperal sepsis in our study was 15 (9.6%), with notable risk factors including anemia, booking status, prolonged labor, cesarean section, postpartum hemorrhage, and rural residence. These findings underscore the need for strengthening antenatal care services to address anemia and improve prenatal booking, particularly in rural areas. Interventions such as promoting skilled birth

attendance, ensuring aseptic delivery practices, and timely management of obstetric complications like prolonged labor and hemorrhage are critical. Addressing these factors through targeted public health initiatives and resource allocation can significantly reduce the burden of puerperal sepsis and improve maternal health outcomes.

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