Original Article

# Does Health Care Facility Delivery Reduces Puerperal Sepsis? An Analysis at a Tertiary Care Hospital

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## Abstract

Objective: To compare the frequency, time lapse, management and outcome of patients with puerperal sepsis in health care facility deliveries versus home deliveries.

Methodology: It was a descriptive study with retrospective data collection conducted at department of Obstetrics, Liaquat University of Medical and Health Sciences, Jamshoro, from January 2017 to June 2020. Sampling of patients was done by non-probability based purposive technique. The inclusion criteria were any patient presenting within 42 days of vaginal delivery with diagnosis of puerperal sepsis without any co morbid illness while the patients with puerperal sepsis after caesarean section, instrumental delivery or abortion or vaginal delivery with co morbid illness were excluded. The patients were divided into 2 groups (Group1= Health facility, Group 2 = Home delivery). Details gathered through case records and data was analyzed by SPSS version 22.0.

Results: The frequency of puerperal sepsis was found to be 0.7%. Out of 121 cases, 58 patients were included in the study. There was no statistically significant association between place of delivery and frequency of cases. The majority of the patients were in the age group 20-30 years in both groups. The time lapse from symptoms to presentation was prolonged in group 2 but not statistically significant. Laparotomy, intensive care unit admission, and mortality were higher in group 2.

Conclusion: Puerperal sepsis after health care facility delivery is an emerging challenge demanding improvement in health practices. Training of traditional birth attendants about safe delivery and early referral can reduce home delivery complications.

Key words: Home delivery, Puerperuim, Sepsis, Health care delivery, Laparotomy, Mortality

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## Introduction

Puerperal sepsis is an infection of genital tract that occurs from rupture of the amniotic sac and within 42 days of delivery with at least two of the following conditions; pelvic pain, fever-oral temperature equal to or higher than $38C^0$ and purulent, cloudy or fetid vaginal discharge or delayed uterine involution.[1] The majority of the cases report after discharge within 1st 24 hours of delivery. The incidence in developing countries is estimated to range between 1% to 17%, with global incidence 4.4% of live births.1 According to WHO it is 6th leading cause of deaths among new mothers, with a death proportion of 9.7%, 11.6% and 7.7% in Africa, Asia and Latin America. On the other hand, only 2.2% of maternal deaths are reported in developed countries.[2] Several studies from Pakistan report as the 3rd leading cause of maternal deaths.[3] Not only the mortality puerperal sepsis lead to significant maternal morbidity due to fever, pelvic abscess, peritonitis and septic shock with long term sequel of infertility and chronic pelvic pain etc.[4] The predisposing factors leading to this morbid illness are related to home deliveries under unhygienic condition, prolonged ruptured membranes, and repeated pelvic examination,

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prolonged labour and obstetrical maneuvers. Poverty, anemia, and pre-existing infection or illness are the imposing factors.[5] increased rate of caesarean section has led to increased risk of puerperal sepsis is related in particular to lack of aseptic measures.6 The 1st known description of this condition dates back to at least 5th century BCE described by Hippocrates. The infections were frequent cause of childbirth related death. In fact from the 1600 through the mid to late, 1800 majority of child bed fever were caused by doctors, having no knowledge of germs and importance of hand washing. The hospital deliveries became common trend in the 17th century in European cities and this led to overcrowding in labour wards, subjecting the women to have frequent pelvic examination, use of contaminated instruments, dressings, bedding under unhygienic condition. It used to be common for the doctor to deliver one baby after another without aseptic measures. The 1st epidemic of puerperal sepsis occurred in 1646 and hospitals throughout Europe and America consistently reported deaths rate between 20-25%, punctuating by intermittent epidemics up to 100%.[7] Ignaz Semmelweis in 1800 noticed much lower incidence of puerperal sepsis in home deliveries in comparison to maternity hospitals. His findings and later on same observations by other obstetricians were not enjoyed by many senior obstetricians and were ridiculed.[8] Charles Delucena, a famous obstetrician stated " Doctors are gentlemen and gentlemen's hands are clean".[9] The experimental use of cleansing agents and antibiotic in 1935 found effective remedies and since then such practice brought the toll of mortality and morbidity down.[10] Never the less the low resource failed to be well compliant with protocols as well as poverty, multiparty, anemia, malnutrition, trend of home birth has made puerperal sepsis a persistent problem.[11] Most of the studies about puerperal sepsis from developed countries have focused on having insight into the pathology, post infectious defense, and antibiotic susceptibility.[12] On the other hand developing countries have their work on addressing determinants, morbidity and mortality.[13] Literature is scant to compare the cases related to health facility deliveries and home deliveries for assessing safe delivery practices. Our unit being a part of tertiary care center receives a large number of these morbid illnesses. The cases related to home deliveries are common, but cases of puerperal sepsis from health care deliveries are emergent problem, which is alarming. This frequently leads to prolonged hospital stay with increased use of broad-spectrum antibiotics, adding workload and financial burden for the hospital side. The significant psychological burden and the impact of long-term sequel on the patient and her family are the hidden components to be touched.

The proposed study is to determine the frequency, time lapse from symptoms, presentation in hospital, management, outcome, and mortality of patients with puerperal sepsis in health care facility deliveries versus home deliveries, and to explore gaps in optimal obstetric care.

## Methodology

It was a descriptive study with retrospective data conducted in the department of Obstetrics, Liaquat University of Medical and Health Sciences, Jamshoro Sindh. The majority of the patients are all over Sindh except Karachi. All confirmed cases of puerperal sepsis following vaginal delivery without any co morbid illness were included in the study. Data was collected from case records from January 2017 to July 2020 by non-probability based purposive sampling. Ethical permission was taken from ethical review committee of the university via letter number LUMHS/REC/-899, dated 26th August 2020.

The inclusion criteria were any patient presenting within 42 days of vaginal delivery with diagnosis of either puerperal sepsis, who were delivered at home or health care facility. Diagnosis was made according to history, clinical examination, and investigations. Employing G power software, considering a 95% confidence level and 80% power of the test, minimum sample required for the study was 40. In order to make the identical parameters for analyzing the risk of puerperal sepsis, caesarean section, instrumental deliveries, post abortal sepsis, and co morbid illness were not excluded from the study. The cases divided into two groups according to place of delivery, with Group 1 were health facility delivered patients while Group 2 were home delivered cases. Demographic details, time lapse between symptoms to presentation in the unit, management, and outcome were gathered from case records. Data was analyzed using SPSS version 22.0. Chi square test used to compare the result in both groups determining the association of place of delivery with puerperal sepsis with 95% confidence interval, where significance level < 0.05 indicating the acceptance of association.

## Results

There were 17068 registered obstetric cases. Total 121 cases of puerperal sepsis, giving a frequency of 0.7%. Out of these 121 cases, 58 patients were recruited for the study. The result found that equal number of cases in either group with no statistically significant association between place of delivery and puerperal sepsis. The majority of the patients were in age group 20-30 years in both group (Table I). Mean age was 28 years in group 1 and 29.5 years in group 2. Mean parity was higher in group 2. The time lapse between symptoms and presentation was longer in group 2 (79% vs 82%) but not statistically significant. All of the patients required broad spectrum antibiotics, cases; evacuation was required more in health faculty group while majority of patients in group 2 had laparotomy. (Table II). Most patients were discharged in satisfactory condition with a hospital stay. However, 6 patients died of the disease with more cases in home delivered cases. (Table III).

**Table I: Demographic Features**

| Study groups | N(%) | Mean age in years | Mean Parity | p-value |
|---|---|---|---|---|
| Group 1 | 29(50%) | 28±5.0 | 2.8±2.3 | 0.287 |
| Group 2 | 29(50%) | 29.7 ±5.1 | 3.7± 2.02 | |

Group I= Health care delivery, Group II= Home delivery

**Table II: Management (n=58)**

| Management | Group 1 (n=29) | Group 2 (n=29) | P value |
|---|---|---|---|
| Antibiotics | 29(100%) | 29(100%) | 0.2 |
| Evacuation of retained products | 14(48%) | 07(24%) | 0.05 |
| Laparotomy | 01(3.45%) | 09(31%) | 0.06 |
| Hysterectomy | 00 | 01(3.4%) | 0.5 |

**Table III: Outcome (n=58)**

| Outcome | Group 1 (n=29) | Group 2 (n=29) | P value |
|---|---|---|---|
| Discharged in satisfactory condition | 28 (96.6%) | 25(86.2%) | 0.09 |
| Intensive care unit admission | 1 (3.45%) | 4 (13.8%) | 0.17 |
| Death | 1 (3.45%) | 5 (17.2%) | 0.97 |

## Discussion

The current study found the frequency of puerperal sepsis as 0.7% of all obstetric admissions. Global incidence is reported from 0.1-10% while in high income countries, an incidence of 0.1 to 0.6%. 14 Our results are found in agreement with Bilal from Sokoto 0.9%.[15] However, the results show a marked lower incidence from old Pakistani studies.[16] We found equal number of cases following deliveries in health care facility and home. Shamshad reported 71% puerperal sepsis after home delivery while Sheeba reported 94% of their cases after home delivery.[17] Our results are quite alarming from other previous Pakistani studies where the high frequency of the cases were reported following home delivery.[3] The majority of these health facility deliveries were outside our hospital, never the less 1/3rd of the cases from labour room of our hospital signifying gaps in optimal infectious control at this tertiary care hospital. This can be attributed to limited capacity of our labour ward and logistics. Currently having capacity of 10 labour suits and 10 beds in pre labour with huge burden of 40-50 laboring patients /24 hours, makes the task of the aseptic measures hard to be taken. More over a number of junior trainees have a temptation to do frequent pelvic examination for the purpose of learning. Emphasis should be given for implementation of hand washing practices and following protocols for vaginal examination and use of antibiotics. It has been in ancient times when Ignaz Semmelweis set the protocols for hand washing with various cleansing agents and noticed the mortality rate from puerperal sepsis reduced from 18 % to less than 3%.[18] Such preventive strategy need to be implemented with regular audits in collaboration with infection control department. There is also need to increase the capacity of labour ward with constant supply of logistics to accommodate huge number of deliveries.

The rest of 2/3rd deliveries from private clinics, Taluka hospitals and rural health centers are of concern too, signifying to disseminate knowledge about infection control practices by conducting refresher courses. The health governing bodies should pay special interest to make a well maintained system of constant check and balance for standards of practices. A health survey in Bangladesh about the knowledge and preventive steps of healthcare personnel for puerperal sepsis showed poor knowledge of preventive steps.[19] Sheeba in her study emphasized the need for regular internal audits to assess the magnitude of disease and identify flaws in management so that optimal care is delivered.[17]

The striking results showing no difference between health facilities versus home deliveries need to be cautiously taken since the usual trend of seeking admission is once the patients develop severe disease. The delay in consultation may be due to a number of facts such as negligence, lack of health awareness due

to illiteracy, financial constraints and cultural barriers and majority of such case may remain hidden and the reported cases may only the tip of an ice berg. Tanjila identified socio cultural barriers affecting the health seeking behavior of pregnant women making them vulnerable to disease and remain untreated.[2] A study from Rural hospital from Sudan also highlighted the limited number of cases attending to hospital due to non-availability of medical care near their homes, financial constraints, lack of transportation and cultural beliefs.[4] The results emphasize the role of such studies to conducted by community approach with the help of lady health workers and community workers with involvement of family peers to have deep insight of problem and generalize results.

The current study found frequency of disease less in age group, 30 years and low parity. This is found in agreement to other Pakistani studies and reported literature from other countries.[17] A high percentage of cases requiring laparotomy, intensive care unit admission, and death rate seen in home delivered patient. This can be related to early identification and use of antibiotics in health care facility group. Early identification of high risk cases, institution of antibiotics, exploration and management of causes are the key interventions to be implemented. This was totally missed in home delivered patients. It is high time to generate community awareness about safe delivery practices and helping them to learn about warning signs for seeking medical care before the situation gets worse.

## Conclusion

Puerperal sepsis after health care facility delivery is an emerging challenge demanding uniform strategies with strict adherence to infection control guidelines; while cases following home deliveries can be prevented by training of traditional birth attendants and generating community awareness about safe delivery practises and teaching danger signs for early referrals. The limitation of this study was that it was a hospital-based study and did not address the community population as most of the cases following home deliveries could not have been reported due to a lack of a proper registry system. Never the less, it has the potential for future research in this regard to have the actual spectrum of the problem for proper planning and management.

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