SCIENTIFIC LETTER

Puerperal infection after caesarean section at Chris Hani Baragwanath Academic Hospital, Johannesburg

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Objectives. To determine the incidence of puerperal sepsis after caesarean section (CS) at Chris Hani Baragwanath Academic Hospital, Johannesburg, South Africa.

Methods. A longitudinal descriptive study was done on women undergoing CS, with follow-up for readmission or development of sepsis, including telephone calls 14 days after delivery. Puerperal sepsis was defined as fever (temperature ≥38°C) with vaginal bleeding, malodorous discharge or pain. Women who telephonically reported pain, bleeding or malodorous discharge were classified as having possible mild wound infection.

Results and conclusion. A total of 272 women were followed up. Four (1.5%) were readmitted with puerperal sepsis, and 30 (11.0%) had possible mild wound infection. There were no significant differences between women with no evidence of infection (*n*=238) and those with possible infection or puerperal sepsis (*n*=34) with respect to indicators of socio-economic status, antenatal care attendance, antenatal anaemia, HIV status, preterm birth, elective CS or skin incision used.

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To the Editor: Puerperal sepsis remains an important cause of maternal morbidity and mortality, especially in less-developed countries.[1] Despite good health service coverage, South Africa has a significant burden of puerperal sepsis, which is its fourth leading cause of maternal mortality.[2] Caesarean section (CS) has been identified as the most important risk factor for postpartum infection.[3] The most common complication associated with CS is sepsis.[4] Estimating the burden of puerperal sepsis among populations is problematic because of differing definitions of puerperal sepsis[5] and lack of postnatal follow-up.[2] There are insufficient data on the incidence of sepsis after CS in South Africa. We conducted this study to determine the incidence of puerperal sepsis after CS in a group of South African women.

This was a longitudinal descriptive study of women who had undergone CS at Chris Hani Baragwanath Academic Hospital (CHBAH), Johannesburg. We obtained permission to do the study from the Human Research Ethics Committee at the University of Witwatersrand and the Institutional Review Board at Morehouse School of Medicine. Women who were less than 18 years of age, had unknown HIV status, or refused to participate were excluded. A period sample was taken of all eligible women from 1 July to 13 August 2010. We identified potential participants using ward admission books, then obtained written informed consent, conducted a brief questionnaire, arranged a follow-up telephonic interview 14 days after delivery, and collected data from the case notes.

Participants were identified as having confirmed puerperal sepsis by continuous surveillance for postnatal admissions for sepsis, or as having 'possible mild wound infection' (our own term), based on information obtained from follow-up telephone calls made to participants at 14 days postpartum. The calls were conducted by one of the researchers using a standardised script. An assistant familiar with local African languages conducted calls for participants who did not understand English. If a participant was readmitted to the hospital during the follow-up period with a fever (≥38°C) and one or more of the following: abnormal malodorous vaginal discharge, abdominal pain or bleeding, she was classified as having puerperal sepsis. If, on the follow-up call, a participant described pain, an abnormal foul-smelling discharge, and bleeding up to the 14th postpartum day, she was classified as having possible mild wound infection. The researcher and assistant urged such women to seek medical assistance during the follow-up interview, but could not confirm whether they did so. Participants who could not be contacted within 3 - 4 days after the first call were considered lost to follow-up and excluded from the final data set.

Data analysis was done using SPSS software, version 18. Continuous data were expressed as means (standard deviations (SDs)),

Table 1. Profile of women with and without evidence of puerperal infection after CS at CHBAH (*N*=238)

	Puerperal sepsis or possible mild wound infection (*n*=34)	No evidence of sepsis or wound infection (*n*=238)	*p*-value
Age (years), mean (SD)	26.8 (±5.9)	27.9 (±6.1)	0.31
Completed matriculation, *n* (%)	13 (38)	106 (45)	0.58
Married or cohabiting, *n* (%)	20 (59)	119 (50)	0.36
Formal housing, *n* (%)	20 (59)	168 (71)	0.17
Antenatal care attendance, *n* (%)	34 (100)	228 (96)	0.62
Antenatal haemoglobin <11.0 g/dl, *n* (%)	10 (29)	52 (22)	0.38
Primigravida, *n* (%)	12 (35)	76 (32)	0.70
HIV infection, *n* (%)	12 (35)	67 (28)	0.42
Previous CS, *n* (%)	14 (41)	76 (32)	0.33
Mid upper arm circumference <23 cm, *n* (%)	5 (15)	17 (7)	0.17
Delivery <37 weeks, *n* (%)	7 (21)	66 (28)	0.54
Rupture of membranes >18 hours, *n* (%)	3 (9)	16 (7)	0.72
Elective CS, *n* (%)	7 (21)	46 (19)	0.82
Transverse skin incision, *n* (%)	27 (79)	189 (79)	1.00
Birth weight <2 500 g, *n* (%)	7 (21)	70 (29)	0.32

and categorical data as proportions and percentages with 95% confidence intervals (CIs). Student's *t*-test and Fisher's exact test were used to compare differences of means in normal distributions and differences in frequencies of categorical variables, respectively, for factors possibly associated with puerperal infections. Statistical significance was determined at $p<0.05$.

Of 342 women screened, 18 were not eligible for inclusion; 324 women therefore participated, but 52 (16.0%) were lost to follow-up, leaving 272 for analysis. The women's mean age was 27.8 (SD 6.1) years; 266 (97.8%) were black Africans; 119 (43.8%) had matriculated; 145 (53.3%) were married or cohabiting; and 188 (69.1%) lived in formal houses. Thirty-four women (12.5%) developed puerperal sepsis or possible mild wound infection. Four (1.5%; 95% CI 0.4 - 3.7%) were readmitted with puerperal sepsis and 30 (11.0%) were classified as having possible mild wound infection on telephonic interview. A demographic and clinical profile of the participants with and without evidence of puerperal infection showed no differences between the groups with respect to any of the included factors, including HIV infection (Table 1). Of the 4 women readmitted, 3 were HIV infected and all had emergency CSs, but 2 were not in labour at the time of the operation.

Despite a high burden of puerperal sepsis in South Africa,[2] the incidence of confirmed puerperal sepsis requiring readmission among the study participants was low at only 1.5%, with another 11% having possible mild wound infection. No risk factors for puerperal infection could be identified, but the study was not powered to show associations with risk factors. The low incidence may be attributed to the modified definition used, with a cut-off at 14 days after delivery instead of the 42 days defined by the World Health Organization.[6] However, a 14-day period is supported by the National Department of Health for the diagnosis of puerperal sepsis.[7] The study was limited by loss to follow-up, although it seems likely that women who had signed to participate would have returned to hospital if they developed moderate or severe sepsis. It is also likely that women admitted elsewhere would be returned to CHBAH hospital for further treatment. Furthermore, the classification of self-reported possible mild wound infection could over-represent sepsis. It should also be noted that these results reflect circumstances at CHBAH hospital, a teaching centre where aseptic techniques are enforced and antibiotic prophylaxis is given at all CSs.

Issues remain around the diagnosis and surveillance system for puerperal sepsis. There is no formalised surveillance system for puerperal sepsis at this hospital or in South Africa as a whole. Without an efficient surveillance system, accurate incidence rates cannot be obtained, so the true burden of this complication remains obscure. Collaborative efforts between hospitals and community health centres could assist in establishing active surveillance of puerperal sepsis to determine incidence rates and facilitate efforts at prevention and treatment.

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