

## Postpartum Infection in Morbidly Obese Women After C-Section: Does Early Prophylactic Oral Antibiotic Use Make a Difference?

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### Abstract

The rising prevalence of morbid obesity particularly in women coupled with a higher likelihood of having a caesarean section (C-section) birth and an increased risk of Surgical Site Infection (SSI) places wound assessment among priority areas in maternity care. There is a level of ambiguity about the efficacy of routine preventative care pathways particularly in morbid obese women with regards to SSI after caesarean section. A pilot study was therefore undertaken to explore the number of women with a C-section infection in a cohort of morbidly obese women during six weeks postpartum against a background of standard care early antibiotic prophylaxis and skin closure practice. A short questionnaire was sent to 59 women with an early pregnancy BMI  $\geq 40$  who gave birth via C-section in a large maternity unit in Sheffield, UK.

Of 39 participants who responded, 20 (51%) developed a post-operative wound infection within 6 weeks postpartum. Infections were higher in the women who had emergency C-section births (14/24, 60%). There was no significant difference in wound infection risk with respect to wound closure material (Chi-square = 0.298, p-value = 0.86) or the use of oral prophylactic antibiotic after birth (Chi-square = 0.2053, p-value = 0.650). Although all the women received routine IV antibiotics before C-section, only 26/39 received the 5 day oral antibiotic prophylaxis after birth. Six of 13 women who did not receive postpartum oral antibiotics (46%) developed a SSI.

In summary, over half of morbidly obese women who delivered by C-section developed a wound infection, despite receiving prophylactic antibiotics. We acknowledge the limitations of these results from a small sample retrospective observational study. However this may indicate that SSI imposes a greater risk because of a lack of antibiotic prophylaxis efficacy and requires further investigation.

**Keywords:** Wound; Surgical site infection; Morbidly obese; Caesarean section

### Brief Communication

The rising prevalence of morbid obesity particularly in women [1] coupled with a higher likelihood of having a caesarean section (C-section) birth [2] and an increased risk of Surgical Site Infection (SSI) [3] places wound assessment among priority areas in maternity care. Caesarean birth is the single most important risk factor for puerperal infection with BMI being a significant independent risk factor for SSI [4]. Local maternal care pathways include the use of prophylactic antibiotics before (at induction of anaesthesia, intravenous) for all women and after (5 days, oral) delivery for those with a BMI  $\geq 40$  (kg/m<sup>2</sup>). However, the efficacy is uncertain [5] since many women may develop infection after discharge from hospital with no routine tracking systems in place [4]. A pilot study was therefore undertaken to explore the number of women with a C-section infection in a cohort of morbidly obese women during six weeks postpartum against a background of standard care early antibiotic prophylaxis and skin closure practice.

As part of a service evaluation, a short questionnaire was sent to 59 women with an early pregnancy BMI  $\geq 40$  who gave birth *via* C-section in Jessop Wing Maternity Hospital, Sheffield, UK from November 2011 to October 2012. Approval was granted by the local clinical effectiveness unit.

Of 59 questionnaires, data are available from 39 women aged 31.4 (5.9) years and with a BMI of 44.4 (6.5) (mean (SD)). Fifteen (38%) women were delivered by elective C-section (indications: one or more previous C-sections, breech presentation, previous traumatic delivery) and 24 (62%) by emergency C-section births (indications: failure to progress in labour, fetal distress, failed induction of labor, pre-eclampsia). Of five who had gestational diabetes, three developed SSI.

Of 39 participants, 20 (51%) developed a post-operative wound infection within 6 weeks postpartum. Infections were higher in the women who had emergency C-section births (14/24, 60%). Half of women with a previous C-section (6/12) had a wound infection. Three (60%) of the five women with GDM developed an infection. There was no significant difference in wound infection risk with respect to wound closure material (Chi-square = 0.298, p-value = 0.86) or the use of oral prophylactic antibiotic after birth (Chi-square = 0.2053, p-value = 0.650) (Table 1).

Although all the women received routine IV antibiotics before C-section, only 26/39 received the 5 day oral antibiotic prophylaxis after birth. Six of 13 women who did not receive postpartum oral antibiotics (46%) developed a SSI (Table 1).

In summary, over half of morbidly obese women who delivered by C-section developed a wound infection, despite receiving prophylactic antibiotics.

Whilst recognising the limitations of these results from a small sample size, if this finding does exist for the larger population of

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	Number of women with infection	No Infection reported
<b>Skin closure Material</b>		
Monocryl™	14	13
Beaded Prolene™	4	4
Staples	2	2
<b>Use of oral prophylactic antibiotics</b>		
Antibiotic prophylaxis	14	12
No antibiotic prophylaxis	6	7

**Table 1:** Surgical site infection in morbidly obese women with respect to skin closure materials and the use of prophylactic antibiotics.

morbidly obese women undergoing C-section, there is a suggestion, at least that in this group of women, that SSI imposes a greater risk because of a lack of antibiotic prophylaxis efficacy. That said, we recognise the further limitations of our observations with respect to a lack of a control group (eg. BMI 30-40) and hence the interpretation of the results outside of the specified group of morbidly obese women. Nevertheless, the observations take a first step in alerting the medical community, already concerned about antibiotic resistance, about SSI risk in this group of postpartum women.

Currently there is no consensus on wound surveillance and tracking within the maternal care pathway to identify and manage wound infection after discharge from hospital other than by self-report. More work is needed to examine the risk, the treatment pathways and outcome of current wound management and outcomes of prophylaxis, especially after discharge from hospital in this high risk group of new mothers.

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