Impact of antimicrobial stewardship interventions on post-elective caesarean antibiotic prophylaxis and surgical site infections

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BACKGROUND

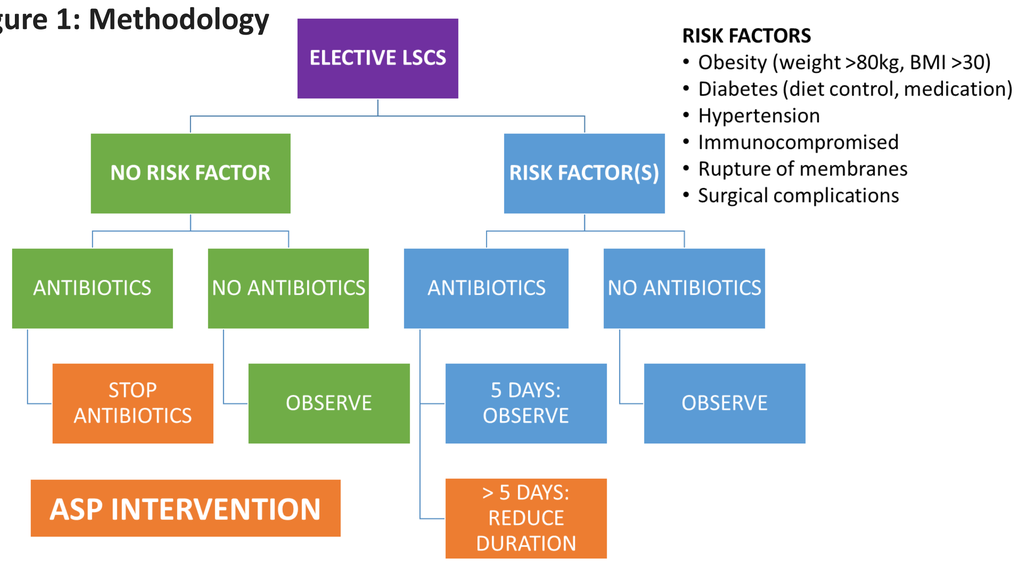
Antimicrobial stewardship programs (ASP) aim to improve appropriate antimicrobial use[1]. International guidelines advocate a single dose of antibiotic within 60 minutes before skin incision to reduce surgical site infections (SSI) rates[2-4]. Post-operative antibiotics are not necessary, especially for those without SSI risk factors [5].

This study aims to evaluate the impact of ASP interventions on post-elective caesarean (eLSCS) oral antibiotic prophylaxis use. In a subgroup of those without surgical site infection (SSI) risk factors, 30-day SSI rates was compared in those who received post-eLSCS oral antibiotics vs. those without.

METHODOLOGY

This pre-post quasi-experimental study was conducted over 9 months (2 months pre- and 7 months post-intervention) in all women admitted for eLSCS in our institution. Interventions included eLSCS surgical prophylaxis guideline dissemination, where a single antibiotic dose within 60 minutes before skin incision was recommended (pre-op antibiotics). Post-eLSCS oral antibiotics was discouraged in those without SSI risk factors (e.g. obesity). This was followed by ASP intervention notes (phase 1) for 3 months, and an additional phone call to the ward team for the next 4 months (phase 2).

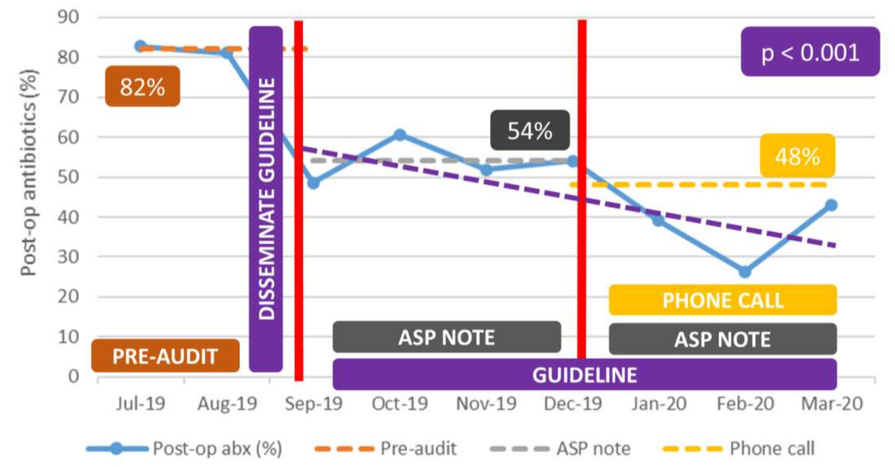
Figure 1: Methodology



RESULTS

A total of 894 women was reviewed. There were 244 women in the pre-intervention phase, 274 in post-intervention phase 1 and 376 in phase 2. Pre-intervention post-eLSCS antibiotic prescribing rates was 82% (200), compared to 54% (148) in phase 1 and 48% (180) in phase 2 (p<0.001) (Figure 2).

Figure 2: Post-operative antibiotic prescription trends



There were 560 women (62.6%) without SSI risk factors. There were no significant differences in baseline characteristics between those who received antibiotics vs. those without. Only 4 of 301 (1.3%) who received oral antibiotics, and 3 of 259 (1.2%) without oral antibiotics developed post-op SSI (p=1.000) (Table 1).

Table 1: Comparison of patients with and without post-operative antibiotics

Patients without SSI risk factors	Post-op antibiotics (n=301)		No antibiotics (n=259)		p-value
Characteristics					
Age (years)*	33	*(4.7)*	34	*(4.5)*	NS
Pregnancy Weight (kg)*	66.9	*(8.4)*	67.0	*(8.1)*	
BMI (kg/m2)*	27.0	*(3.3)*	27.0	*(3.2)*	
Smoking	2	*(0.7)*	2	*(0.8)*	
Co-morbidities	26	*(8.6)*	33	*(12.7)*	
Appropriate pre-op antibiotics	170 of 171	*(99.4)*	228 of 231	*(98.7)*	
Op details					
Estimated blood loss (mL)*	300	*(272)*	300	*(195)*	NS
Length of operation (min)*	40	*(19.9)*	40	*(16.8)*	
Length of stay (days)*	3	*(0.8)*	3	*(1.1)*	
Duration of antibiotics (days)*	6	*(0.9)*	0.3	*(0.3)*	p < 0.05
Outcomes					
30-day surgical site infection	4	*(1.3)*	3	*(1.2)*	NS

*Legend: All no. (%), *Median (SD), NS: not significant*

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CONCLUSION

Combined ASP interventions such as dissemination of guidelines with phone calls to ward teams can help to reduce rates of post-eLSCS antibiotic prophylaxis. Post-operative antibiotics is not necessary for patients without risk factors, particularly where pre-operative prophylaxis appropriateness is high. In those without SSI risk factors, use of post-eLSCS antibiotics did not impact SSI rates.