

Reducing postpartum infection: How to beat the challenges and take action

The conference 'Delivering today's babies with tomorrow's techniques: how to reduce postpartum infection' took place at the Radisson Blu in East Midlands, on 12 and 13 October. Attended by 52 midwives, matrons, theatre sisters and consultants for obstetrics and gynaecology, this 2-day event addressed the importance of preventing infection, highlighted the challenges in midwifery and encouraged the delegates to take action in their own practices by adopting specific measures that could help reduce postpartum infection, such as training midwives in wound care and dressing selection. Perfect timing to address such topics, considering it was just a few days before International Infection Prevention Week.

Antibiotic resistance: a global threat Is prevention better than cure?

According to Rose Cooper, Professor of Microbiology at Cardiff Metropolitan University, an infection is always a costly business, so the best policy is never to get one in the first place. Cooper explained this further on her opening talk on antibiotic resistance during the evening of 12 October. She began her presentation by describing the historic events that led to the discovery and widespread use of antibiotics, highlighting that, whenever a new antibiotic is introduced, resistance will follow:

'The problem with antibiotics is they target a particular function in the microbial agent, which provides the opportunity for resistance to arise. When we introduce an antibiotic, sooner or later, we will see antibiotic resistance.'

This issue has discouraged research and development on new antibiotics, with fewer pharmaceutical companies investing in it, pointed out Cooper. She then named the top-10 resistant organisms (World Health Organization (WHO), 2017), five of which can be implicated in wound infection, and warned:

Abstract

In October, the *British Journal of Midwifery (BJM)*, *Journal of Wound Care (JWC)* and BSN medical held a conference on infection prevention, welcoming more than 50 delegates. This event sought to promote the latest techniques for managing and preventing post-caesarean section infection, introducing dressing choices and discussing potential pathways to identify the most appropriate treatment. Two of the key takeaway points expressed by the attendees were the importance of addressing today's challenges by taking action, and the need to train midwives in wound care and dressing selection. Camila Fronzo reports.

Keywords

Caesarean section | Antibiotic resistance | Surgical site infection | DACC-coated dressing | Surveillance | #postpartuminfection

'Today, about 700 000 people die of antimicrobial-resistance infections in the world. By 2050, that number could increase to 10 million people annually (O'Neill, 2014). This is a global threat.'

Non-antibiotic and antimicrobial strategies are needed to avoid the emergence of resistant organisms. These strategies may include the use of antiseptics, such as silver, iodine, chlorhexidine and honey, among others. But there is another issue: resistance to antiseptics has also been observed. Therefore, if both antibiotics and antiseptics can create resistance, alternative techniques, such as maggot therapy, microbial binding, and negative pressure wound therapy (NPWT), should be considered. Cooper stressed:

'Preventing infection is going to become more important than it has been in the past. We've got to think about how we're going to use microbial agents, and which alternative methods or techniques can be used.'

What gets measured, gets done

How can we accurately know what a patient's chance of infection is if we do not monitor this? The next morning, Lilian Chiwera, Surgical Site Infection Surveillance Team Leader at Guy's and St Thomas' NHS Foundation Trust,

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Speakers George Smith (left) and Lilian Chiwera (right) addressed this question by presenting a surveillance system that monitors surgical site infections (SSIs).

In 2010, Chiwera and the multidisciplinary team at Guy's and St Thomas' decided to take action. They came up with a surveillance programme for caesarean section SSIs that aimed to establish local SSI rates and refine accuracy and credibility of data, in order to identify potential gaps in practice and suggest improvements.

The first step was to establish a surveillance methodology for standardising data collection, which included surveillance forms in line with the Public Health England (2013) recommendations. These forms collected patient demographic and operation details. Postoperatively, surveillance forms were completed to enable data capture on patients who developed SSIs during inpatient episodes, at readmission, or in the community. Finally, postal questionnaires, telephone surveys, and data on feedback from GPs and other health professionals were used to gather information on patients who developed infections after discharge from hospital.

The results from the initial data validation in 2013 triggered various improvement initiatives, which were in line with the National Institute for Health and Care Excellence (NICE) guidelines on SSI reduction (NICE, 2008; NICE, 2013). In 2015 and 2017, subsequent data validation were done to evaluate the impact of those improvement initiatives. Chiwera reported that the SSI incidence in her organisation declined from 13.3% in 2013 to 7% by 2017.

The team also undertook SSI surveillance of other specialties such as paediatric cardiac surgery, where babies had complex cardiac conditions requiring surgery a few days to months after they were born. The results were impressive: a 93% reduction in paediatric cardiac SSIs,

from 42 in 2009, to only 3 in 2016, was noted. Chiwera's team, together with other multidisciplinary teams, also saw a reduction in paediatric spinal surgery SSIs from 12 in 2013 to zero in 2016. It has now been 21 months since they identified an infection in this area. Chiwera highlighted:

'When you collect data, you are able to provide assurance on how patients and organisations are being managed, identify potential gaps in practice and institute measures to improve.'

In summary, good surveillance data can help demonstrate improvement and cost savings, as well as provide the information needed to confidently consider other improvement initiatives, such as using a different dressing.

Dressing choices to reduce the risk of SSI

The next talk, presented by George Smith, Senior Lecturer and Honorary Consultant in General and Vascular Surgery at Hull York Medical School, discussed the risks of SSI in caesarean sections and suggested an SSI prevention method using dialkylcarbamoyl chloride (DACC)-coated dressings.

More than 160 000 caesarean sections are performed in the UK every year (NHS Digital, 2015). The SSI rate in caesarean sections is commonly around 10–15% (Wloch et al, 2012; Saeed et al, 2017), which is similar to operations where large bowels are excised. Caesarean sections are getting much higher SSI rates than expected, said Smith:

'SSI rates were frequently underestimated, because most caesarean wound infections seem to happen after discharge, and so a lot of them were getting missed.'

One in three postoperative deaths are related, at least in part, to an SSI (Astagneauf et al, 2001). Some of the risks for developing an SSI include: lack or improper use of pre-operative prophylaxis antibiotics; prolonged labour and chorioamnionitis; duration of rupture of membranes; emergency caesarean section, and caesarean section for fetal distress; suboptimal pre-surgical haemoglobin; and longer duration of surgery.

Smith also described the three types of SSIs:

- Superficial incisional: involves skin and subcutaneous tissue of the incision
- Deep incisional: involves deep soft tissues of the incision, such as fascial and muscle layers
- Organ/space: involves any part of the body deeper than the fascial and muscle layers, that is opened or manipulated during the operative procedure (Centers for Disease Control and Prevention, 2017).

He then mentioned the effects that pregnant women could experience with an SSI, from scarring and low mood, to isolation due to wound malodour. These effects and the high mortality rates highlight the importance of prevention to avoid SSIs.

Preventing SSIs in the postoperative phase: What the evidence says

Smith then presented evidence on a tool that could help avoid SSIs, while aiming to minimise the use of antibiotics or antimicrobials. The coating of a DACC-coated dressing (Leukomed Sorbact, BSN medical) contains a hydrophobic material that repels water and incarcerates bacteria, preventing propagation and facilitating removal. He emphasised its key benefits:

‘Silver and chlorhexidine are starting to show evidence of resistance. DACC-coated dressings have a decreased chance of promoting bacterial resistance, because there is no cell mutation. There is no systemic absorption either, so, if a patient is breast feeding, they can still use this.’

A study by Bua et al (2017) associated DACC-coated dressings (Leukomed Sorbact, BSN medical) with a significant reduction in SSI rates in the early postoperative period, compared with standard dressings (1 SSI versus 10 SSI; a relative risk reduction of 47%). Mosti et al (2015) also showed that postoperative patients treated with a DACC-coated dressing (Cutimed Sorbact, BSN medical) saw a markedly improved reduction in bacteria (73.1%), compared with those treated with silver dressings (41.6%). A randomised control trial (Stanirowski et al, 2016) with 543 patients showed statistically significant results in SSI rates in the DACC group versus the standard dressing group: 1.8% and 5.2%, respectively.

In addition, Smith explained the potential cost savings when using these dressings to prevent SSIs. The average cost of a DACC-coated dressing, he said, is £3 more than a standard one. Three dressings per patient would represent about £9 more per treated patient, meaning it would cost £1.4 million to treat all caesarean sections in the UK with DACC-coated dressings in a year. He then put those numbers in context:

‘One SSI costs around £3200. So, with 160 000 caesarean sections in the UK at a 10% SSI rate, we would have 16 000 SSIs. As Stanirowski et al (2016) and Bua et al (2017) show, if we can prevent approximately half of those, we could save £25 million in a year. Prevention is decisively better than a cure.’

Smith, who began his talk by asking questions to

Box 1. Key takeaway points

- An effective surveillance system could help identify potential gaps in practice
- The use of alternative methods to treat infection, such as DACC-coated dressings, could help address the antibiotic resistance issue
- Many midwives have no nursing experience and have little knowledge about dressings

test the delegates’ knowledge, finished his presentation by repeating the questions to check whether the main messages had been successfully received. Two key learning points were:

- Delegates increased their original estimate of caesarean wounds in the UK from ‘over 12 000’ to ‘over 16 000’
- Attendees also understood that silver and chlorhexidine were showing some antibiotic resistance.

Vaginal birth after caesarean section

After lunch, Belinda Green, Consultant Midwife and Research Theme Lead at University College London Hospitals, discussed vaginal birth after caesarean (VBAC). She cited the main indications for repeat elective caesarean section, including fear of birth and fetal or maternal indications. She highlighted that caesarean sections are among the most common surgical procedures, but that they are also more expensive per total hospital stay than vaginal delivery and lead to more complications and re-hospitalisations. The irony was evident:

‘On one hand, we are mandated to provide choice on birth mode; on the other hand, we have to focus on reducing caesarean section rates and the costs associated with it’.

Green also discussed the practical issues that midwives face, such as seeing patients who have given birth in another country or hospital and not being able to get information on the type of incision, position of the uterine scar, or whether single or double suturing was used. She also described the legal implications and most common allegations in her practice, and stressed the importance of keeping up to date with clinical guidelines to enhance knowledge of risks and benefits. Discussing the risks of induced and augmented labour, she warned:

‘Women should be informed that there is a 2–3 fold increased risk of uterine rupture and a 1.5 fold increased risk of caesarean section.’

Green also emphasised the responsibility that midwives have to ensure birth environments are women-centred, friendly and safe, and the need for all women to have a high quality and safe birth experience:

‘Some women can’t even think about getting pregnant again. It makes me think, what have we done to women that have made them so fearful?’

Post-caesarean section SSI prevention dressing pathways

The last session described interactive approaches to dressing selection and pathway implementation, and the delegates were divided into small groups to design their own post-caesarean SSI prevention dressing pathway.

Some groups focused on improving their surveillance practices and educating patients on how to keep their wounds clean, while others highlighted involving the tissue viability nurse team. Many, however, admitted they were not currently implementing any of these ideas in their units, either because they had not thought about them before, or due to time constraints and staff shortage.

Time to take action

Throughout the day, many delegates suggested different ways in which they would use the learning outcomes from the conference (*Box 1*) to take action within their practices. Their suggestions included:

- Ensuring all newly qualified midwives have a basic standard of knowledge on wound care
- Starting a task group aiming to change wound dressings
- Developing a care pathway for gynaecology
- Looking into the number of wound infections post-caesarean section.

One participant said:

‘I found the event very interesting and informative, as well as empowering. I definitely want to go back and make some changes.’

Most delegates agreed that, despite knowing how to prevent infection, midwives are not trained on how to identify infection or treat it. Two attendees stated:

‘Our hospital assumed midwives knew what to do with caesarean wounds, but the majority said they didn’t.’

‘Most midwives have no nursing experience and don’t understand about dressings.’

Conclusion

Active participation was noted throughout the event. Delegates identified the challenges in their practice (lack of wound care training, poor dressing knowledge and uncertainty of how to treat infection) and suggested different ways to tackle these (*Box 2*). There was a general consensus that, if nothing changes, nothing changes. Taking action to reduce postpartum infection was the ultimate key message. **BJM**

Box 2. Make it happen

- Consider alternative techniques to avoid the use of antibiotics and antiseptics, as these can create resistance
- Implement a surveillance system to monitor SSI rates and get accurate data to identify gaps in practice
- Prevent SSI in caesarean sections by considering the use of DACC-coated dressings
- Provide a high quality birth experience by ensuring birth environments are women-centred, friendly and safe.

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