

Sources of systemic infection

Slide 1

Greetings. In this webinar we will discuss where does the infection come from and how a baby gets infected?

Slide 2

This slides shows common bacteria that cause sepsis- in hospitalized neonates. These include *Acinetobacter*, *Klebsiella*, *Escherichia coli*, *Staphylococcus aureus*, and Coagulase negative staphylococci

Slide 3

The figure in this slide shows antimicrobial resistance amongst common pathogens causing sepsis in hospitalized neonates. As you can see 62% of *Klebsiella* is resistant to cephalosporins, 34.9% to carbapenams and 53.8% had multidrug resistance. *Acinetobacter* is even worse. Similarly *Pseudomonas* and *E. coli* also had high level of resistance. Gram positives also had high level of resistance. This level of antimicrobial resistance is really dangerous and pose a grave threat to the health of babies. The high level of resistance has emerged as consequence of indiscriminate use of antibiotics by all of us in health sector as well as in animal husbandry and agriculture.

Slide 4

Before we discuss sources of infection, Let us see this classification of NNS based on age of neonate at the onset of sepsis. If sepsis manifests at or before 72 hours of life- it is known as early onset sepsis. While the cases manifesting after 72 hours are known as late onset sepsis. This classification is important as the two types of sepsis are supposed to have different sources, causative bacteria, manifestations as well as outcomes.

Slide 5

Here we describe where the infection comes from in EOS. The bacteria from the rectum and perineum of mother ascends to maternal genital tract. While passing thru the birth canal, the baby picks up this infection. Alternatively, the infection can ascend to amniotic cavity especially when membrane ruptures prematurely. From there it reaches to the baby thru ingestion or aspiration and early onset sepsis.

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This is what is known as vertical transmission- from mother to baby.

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EOS happens more often when one or more of these perinatal risk factors are present. These include:

It is important to know that EOS on many occasions happens without any of these risk factors as well.

Slide 8

As opposed to EOS, LOS in hospitalized neonates also known as healthcare associated infection or HAI. It is acquired from the environment through bad care giving practices. The most important reason is inadequate hand hygiene practiced by the nurses and doctors of the unit. Their contaminated hands most often transmit infection of the babies under their care. The other methods of LOS includes- too many procedures, investigations, no asepsis during procedures, infection occurring during ventilation particularly during ET suction, overcrowding in the unit, lack of breastmilk feeding, use of IV fluids and unnecessary drugs and antibiotics.

Slide 9

LOS in the community is acquired from bad practices in the homes and these include lack of breastfeeding, unclean cord practices, poor hygiene, many skin pustules and use of prelacteal or supplemental feeding

Slide 10

This slide has very important message. While the EOS and LOS are pretty distinct in developed nations but that is not the case in developing countries. Bacterial pathogens, manifestations and antimicrobial resistance are similar between EOS and LOS in developing countries suggesting a similar pathogenesis. It seems that bad practices in birthing areas and during resuscitation and care giving during initial few hours of birth results in EOS, which actually like LOS due to horizontal transmission.

Slide 11

Prevention of EOS therefore involves preventing and managing maternal risk factors as outlined in previous slide as well as following hygienic practices during birthing and resuscitation as well as during early few hours of birth.

LOS would be prevented by good NICU practices in hospital, hygienic practices in homes. We have a separate webinar on this issue.

Breast milk feeding would prevent both EOS as well as LOS