

## Infections - The Research

One recurrent line of academic enquiry in sudden infant death syndrome (SIDS) research is the potential role of underlying infection. Evidence from post-mortem examinations and microbiological studies have suggested that infectious processes may contribute to, or exacerbate, an infant's vulnerability to SIDS, in a subgroup of cases.

Autopsy studies have provided some evidence supporting an infectious mechanism for some SIDS cases. An extensive review of autopsies performed at a single centre in London between 1996 and 2005, compared bacterial cultures from infants who died of SIDS with those from infants whose deaths were attributed to clear, non-infective causes. This found a significantly higher proportion of SIDS cases yielded bacterial pathogens such as *Staphylococcus aureus* (16% vs 9%) and *Escherichia coli* (6% vs 1%), suggesting a possible association between infection and SIDS

<sup>1</sup>. A similar study in Sheffield of autopsies between 2004 and 2007 reported that 49% of infants had at least one potentially pathogenic organism isolated at autopsy. However, the authors cautioned that the presence of these organisms did not necessarily imply causation, highlighting the difficulty in distinguishing between colonization and infection in post-mortem samples<sup>2</sup>.

Comparable findings have been observed in some international studies. A study analysing SIDS cases in South Australia between 1978 and 2004, identified *Staphylococcus aureus* in 11% of SIDS infants but in none of the age-matched control infants who died from non-infective causes<sup>3</sup>.

Other pathogens have also been investigated in relation to SIDS. A study in Chile of infants who died in Santiago between 1999 and 2004 found evidence of *Pneumocystis jirovecii* in 84% (71/85) of SIDS infants and 66% (10/15) of explained infant deaths; this higher proportion was not statistically significant, potentially due to the small size of the control group<sup>4</sup>. *Clostridium botulinum* was proposed as a potential causative agent in 1978<sup>5</sup>. A subsequent study found 19% of 57 cases of SIDS in Göttingen, Germany, in 1990s, had some evidence of the toxins or spores; however, this was comparable to the small non-SIDS group<sup>6</sup>.

Beyond microbiological findings, several epidemiological studies have examined the relationship between signs of illness preceding death and the occurrence of SIDS. One UK study of SIDS infants in the late 1980s found that signs of illness were common in both SIDS infants and control infants. It found that SIDS infants were also no more likely than controls to have seen their general practitioner<sup>7</sup>. A study of cases between 1998 and 2001 in Germany similarly found no significant association between prior infectious symptoms and SIDS<sup>8</sup>. These were contrasted by a study in New Zealand in the 1990s which found the SIDS cases were three times more likely to have been unwell in the two weeks prior to death compared with controls, though all but 1% had sought appropriate medical care<sup>9</sup>. Recent research in the UK showed 31% of SIDS infants had signs of illness in the 24 hours prior to their death, but no comparative data was gathered to establish if this was statistically significant<sup>10</sup>.

Prospective, observational research has also highlighted symptoms found among SIDS infants. These include pallor, sweating, irritability and feeling cold. However, though statistically more likely in SIDS infants, these symptoms were not experienced by all the infants who died and were also found in the control infants<sup>11</sup>, reflecting the multi-factorial theories of the causes of SIDS.

It is worth noting that infections can cause infant and child deaths which, though sudden, are found to have a cause, and are therefore not classed as SIDS. Infections account for around 5% of child deaths in the UK<sup>12</sup>. Infants have an immature immune system and can become unwell quickly and with few obvious signs. Prevention and prompt management of infections is thus an important element of preventing infant deaths.

## References

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## Frequently asked questions

### What does the research show?

Research suggests that infections may play a role in some cases of SIDS. Autopsy studies in the UK, South Australia, and elsewhere have found higher rates of bacteria such as *Staphylococcus aureus* and *Escherichia coli* in SIDS infants compared with those who died from known causes, though the presence of bacteria does not necessarily mean it caused death.

Research has been mixed as to whether infants who are unwell are more likely to die from SIDS. While infections can cause sudden infant deaths that are not classified as SIDS, infants' immature

immune systems mean they can become unwell quickly. Preventing and promptly managing infections remains an important part of reducing infant mortality.

### How do I tell if my baby is unwell?

We've created the Baby Check app for families of babies up to six months of age. It includes a series of checks and questions that test for different symptoms and lets parents and carers know whether their baby needs to see a health professional.

### How do I ask people visiting my baby to wash their hands and not kiss my baby?

It can feel awkward asking people not to kiss your baby and to wash their hands before touching or holding them. Here are some phrases that might help you word your request:

- We're asking all visitors to wash their hands as they arrive.
- It's now recommended that visitors wash their hands before touching new babies.
- Yes, you can hold her, but would you mind not giving her a kiss? Apparently, babies' immune systems aren't ready for that yet.
- My midwife told me that only people in our household should kiss him, so we're trying to stick to that.
- The Lullaby Trust's advice is to 'Think Hands And No KisseS'. It helps protect babies from infections, so we're asking everyone to follow that.

### What are the key takeaways for families?

It is not clear what role infection plays in SIDS deaths; however, infection is a key cause of infant death which would not be classed as SIDS. It is therefore important to take measures to prevent infection and see a GP or go to A&E if there are any concerns about your baby's health.

