Surgical Infections More Likely In Patients With History Of Skin Infection

People with a past history of just a single skin infection may be three times more likely to develop a painful, costly — and potentially deadly — surgical site infection (SSI) when they have an operation, according to new Johns Hopkins research. The increased risk, described online in the *Annals of Surgery,* suggests there are underlying biological differences in the way individuals respond to skin cuts that need to be better understood in order to prevent SSIs, the researchers say.

Even when all of the proper procedures known to prevent SSIs are followed — from administering pre-operative antibiotics to using the correct antiseptic to prepare the skin during surgery — some patients appear to be much more susceptible than others to contracting an infection, they add. Although the research does not establish a cause-and-effect relationship between a past skin infection and SSI, the research team says the association between them is strong and should not be ignored.

“What this research suggests is that people have intrinsic differences in how susceptible they are to infection and that we need to know their skin infection histories,” says study leader Nauder Faraday, M.D., M.P.H., an associate professor of anesthesiology and critical care medicine at the Johns Hopkins University School of Medicine. “Now that we have these findings, we must learn more about the exact molecular basis for the difference and develop new strategies to prevent harm.”

Each year, an estimated 500,000 patients in the United States develop SSIs, which are responsible for more than 10,000 deaths, disability and decreased quality of life. As a result, reducing these complications has become a national priority. The Centers for Medicare and Medicaid Services (CMS) considers many SSIs to be preventable and has begun to refuse covering the cost of additional care related to SSIs after some cardiac and orthopedic procedures.

In their study, Faraday and his colleagues analyzed information before, during and after surgery for 613 patients, with an average age of 62. The operations they underwent included cardiac surgery, vascular surgery, neurosurgery or spinal surgery and all were followed for six months after their procedures, performed at The Johns Hopkins Hospital and the University of Maryland Medical Center between February 1, 2007 and August 20, 2010. Some 22 percent had a history of skin infection.

Twenty-four patients developed an SSI within 180 days of surgery, and five of them died from the condition. Another 15 died from non-infectious causes. Of those who had a history of skin infection, 6.7 percent got an SSI compared with 3.9 percent of

those without a history of skin disease. It made no difference whether the skin infection was recent or had occurred years earlier. Researchers also took into account and adjusted for other known risk factors for SSI, including the patient's age, a diagnosis of diabetes and some medications they were taking.

Faraday says it is logical that someone with a history of skin infection could be more likely to get an infection after surgery. The same types of bacteria that cause such skin infections as abscesses, impetigo or cellulitis, he says, are the same types of bacteria known to cause wound infections in the operations that were studied. When someone's immune system responds to exposure to these bugs by developing an infection, it makes sense that the person might have the same reaction when taxed again in a similar way during surgery. Infectious agents can be present or enter even thoroughly cleaned and sterilized hospital environments.

"People are exposed to bacteria and viruses all the time," Faraday says, but even those exposed to the same pathogens respond differently. "Your neighbor may come down with pneumonia and you won't, even if exposed at the same time to the same germs. Everyone is different and if we treat everyone as though they're the same, we will never get the risk level to zero."

Faraday says if his results are right and individual differences in biology account for some SSI risk, then penalties imposed on hospitals that fail to prevent SSIs may be at least partly premature. It's clear, he says, that at least a portion of these infections may occur regardless of current infection-control standards, including those recommended by the Centers for Disease Control and Prevention. Given the lack of knowledge about the origins of individual differences in risk, he says there is reason for concern that CMS considers many SSIs to be completely preventable.

"The problem with financial penalties instituted by CMS is that it implies we know everything about how to prevent surgical site infections and if we just do the right thing, we won't have complications," he says. "There's no doubt we can and should do better, but we won't eliminate infections with the knowledge and treatments we have now. There's still a lot to learn if we want to reach our goal of zero complications."

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