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Topical antibiotic shows promise in burn wound study

By Paul Wynn
Contributing Editor

Seattle — A topical antibiotic that saved the lives of animals with severe burn wounds will soon be tested in humans. Investigators are eager to examine whether the synthetic compound promotes wound healing, since some topical antibiotics are known to inhibit the dermal healing process.

In the burn wound study, the majority of animals treated with the novel compound, code named D2A21, survived over a 14-day period, said Michael Neumeister, M.D., assistant professor of plastic surgery, Southern Illinois University School of Medicine, Springfield.

"The ones that were treated all lived, except one animal that died around day 10," said Dr. Neumeister, who presented the findings at the Plastic Surgery Research Council Conference in Seattle.

Under the study protocol, researchers applied the bacteria *Pseudomonas aeruginosa* topically over the burned tissue. The study used a standard full-thickness burn model, using laboratory rats.

Final results showed that more than 85 percent of the animals receiving treatment survived, but none of the animals in the control group lived past 14 days. The mean survival time post infection was 13.1 days for the treatment group compared to 8.1 days for the control group.

Investigators also measured the animals' weight gain to evaluate the recovery from the bacterial infection. Animals that did not receive the antibiotic lost weight and eventually died, but animals that received the compound maintained their weight. "That's an indication that the compound helps the animals to recover more quickly from the infection," Dr. Neumeister said.

Currently, he is conducting absorption studies by using radioactive nucleotides. "We think it's being delivered locally where it's topically applied. When we finish the absorption studies that will help us look for certain areas in the body in terms of any other possible consequences of the compound."

Once the absorption studies are completed, Dr. Neumeister's research team will begin enrolling humans in a Phase I trial. The study will compare the agent to a standard topical burn medication such as neosporin or silver sulfadiazene. More than half a dozen burn units at medical centers throughout the United States and Canada have expressed interest in participating in the next clinical study on infected burns, said Dr. Neumeister.

Earlier studies of the topical antibiotic found it effective against multidrug-resistant strains of not only *Pseudomonas aeruginosa* but also *Staphylococcus aureus*, which has grown increasingly resistant to common antibiotics.

Dr. Neumeister, along with his colleague Charles Chalekson, M.D., evaluated the compound for its antibacterial applications in a separate animal study. At the American Burn Association Conference, the two physicians presented their research, which showed the compound demonstrated significant activity against *Pseudomonas aeruginosa*. Animals treated with the topical medication showed no growth in the burn eschar and demonstrated significantly less bacterial growth in the subeschar muscle compared to the control group. Dr. Neumeister said, "We think its going to be good against some of the really virulent bacteria that you find in hospitals and in chronic wounds."

Researchers at Demegen Inc., which owns the composition of matter patent rights to the compound, are also examining the agent as a vaginal gel to prevent infections such as chlamydia. Demegen, based in Pittsburgh, was co-founded by Jesse Jaynes, Ph.D., who is the inventor of this class of compounds. DT