Postburn Outcomes Found to Be Worse in Regular Smokers

BY PATRICE WENDLING
Chicago Bureau

CHICAGO — Burn victims who are regular smokers prior to their injuries have poorer outcomes than do nonsmokers, data presented at the annual meeting of the American Burn Association suggest.

In a retrospective analysis of 240 patients, smokers had significantly more surgical procedures than did nonsmokers (1.3 vs. 0.8) and significantly longer hospital stays (13 vs. 9.5 days).

Additionally, smokers had an 85% increased risk of infection during inpatient treatment, said lead investigator Neal Doran, Ph.D., of the University of California, San Diego. The infection rate was 51% in smokers and 36% in nonsmokers, a significant difference.

The study included 80 patients, mean age 35 years, who smoked at least weekly, and 160 nonsmokers, mean age 37 years. The total body surface area burned was similar between smokers (average 7%, range 0.5%-35%) and nonsmokers (average 6%, range 0.3%-36%). The source of burns was flame in roughly 50% of cases, scald in 20%, contact burns in 10%, and chemical, tar, steam, and sunburns in the remainder.

Impaired wound healing, defined as skin graft failure, was not significantly different between smokers and nonsmokers (10% vs. 3%), Dr. Doran said. Impaired wound healing likely was not statistically different between groups because of the relatively few graft failures in either group, and also because graft failure—as a measure of wound healing—represents the extreme negative end of the healing continuum. Still, smokers were almost four times as likely to have graft failure compared with nonsmokers (odds ratio 3.95).

Previous studies have shown that smoking is a significant impediment to wound healing because of the effects of the various chemical components of cigarette smoke such as nicotine, carbon monoxide, and hydrogen cyanide—all of which inhibit oxygen delivery to the wound site.

Because of the longer hospital stays, the cost of treatment was about $3,150 more per smoker, not including the cost of surgeries.

Burn patients are three times more likely to smoke. "When someone has had a health scare, it is an ideal time to provide a motivational intervention intended to change [that person's] behavior," he said.

An audience member observed that 55% of smokers had flame burns and that this uncommon burn pattern results in deeper tissue injuriest that may account for the longer healing times reported among smokers. Dr. Doran responded that the rate of flame burns was not significantly different between the two groups, with 46% of nonsmokers also having flame burns.

Limitations of the study, conducted by Dr. Doran and associates, include the lack of information on the exact number of cigarettes smoked prior to injury and smoking status during hospitalization. Postdischarge outcomes are currently being analyzed. ■

For Assessing Wounds, PUSH Tool Outperforms Judgment

BY KEITH HAGLUND
Senior Editor

SALT LAKE CITY — The Pressure Ulcer Scale for Healing proved superior to assessment by experienced nurses in determining status and progression of long-term care residents' wounds, researchers reported at the annual symposium of the American Medical Directors Association.

"It was surprising because we thought the clinical way was the better way," said Dr. Erica George-Saintilus with Long Island Jewish Medical Center, who presented a poster on her study at the center-affiliated Cold Spring Hills Center for Nursing and Rehabilitation in Woodbury, N.Y.

Whereas nurses assessed the wounds primarily by subjective impressions and wound size, the Pressure Ulcer Scale for Healing (PUSH) tool tallied three parameters:

- Wound size in scores representing skin area from none (0) to more than 24 cm^2 (10).
- Amount of exudate from none (0) to heavy (3).
- Tissue type from closed/resurfaced (0) to necrotic tissue/eschar (4).

The team reviewed records of all residents with stage II-IV ulcers in the 627-bed skilled nursing facility from 2004 through 2006. Weekly reports on the wounds included data sufficient to calculate a PUSH score as well as nurse assessments such as "improved," "deteriorated," or "unchanged." In patients with multiple wounds, the study tracked only one ulcer.

"There's no indication [from statistical analyses] that nurses' observations agree at all with the PUSH," said Dr. George-Saintilus.

Looking specifically at 2 months of data for 30 residents, the researchers determined that PUSH scores were better than the nurses' assessments at indicating the direction that a wound was taking. Dr. George-Saintilus pointed out instances in which a pressure ulcer that a nurse had recorded as "healed" returned and got worse. In contrast, PUSH scores were more likely to indicate the true progression of a wound.

Further, Dr. George-Saintilus and her colleagues discovered that the nurses' assessments were idiosyncratic. "Each nurse has her own way of giving her impression," the researcher said.

PUSH was introduced 11 years ago by the National Pressure Ulcer Advisory Panel, a coalition of corporate and professional organizations that sets care standards. AMDA's "Pressure Ulcers in the Long-Term Care Setting" clinical practice guideline cites PUSH as a "validated tool for characterizing and monitoring pressure ulcers." The guideline includes directions and a blank scoring sheet, and the advisory panel offers the same at http://www.npuap.org/PDF/push3.pdf.

Dr. George-Saintilus said that her observations of nurses at the Cold Spring Hills facility, which now uses the PUSH tool, show that PUSH is actually quicker to use than the subjective system. The old record keeping included nurses' assessments and several wound parameters but didn't combine those data into a score that could be tracked as easily as the PUSH score. She said that PUSH "saves time and money." ■

Insulin May Reduce Burn Infections, Study Shows

BY JEFF EVANS
Senior Writer

CINCINNATI — Control of blood glucose levels through intensive insulin therapy has been shown to reduce morbidity in both surgical and medical ICU patients, as well as mortality in surgical ICU patients. Results of a retrospective study now suggest that implementation of this therapy in burn patients may reduce the rate of infectious complications but not mortality.

Maintaining mean blood glucose levels of less than 140 mg/dL reduced the rate of pneumonia, ventilator-associated pneumonia, and urinary tract infections in 71 burn patients who received intensive insulin therapy, compared with 81 burn patients in the same ICU during the year before the protocol was implemented, Dr. Mark R. Hemmila reported at the annual meeting of the Central Surgical Association.

'A blood glucose level greater than 140 mg/dL should heighten the clinical suspicion for presence of an infection.'

DR. HEMMILA

But some discussants at the meeting questioned whether certain weaknesses in the study's design and differences in patient characteristics may have contributed to its results.

During the first year of an intensive insulin therapy protocol (July 2005 to June 2006), Dr. Hemmila and his colleagues at the University of Michigan, Ann Arbor, sought to bring burn patients' blood glucose levels to less than 140 mg/dL. In the previous year (July 2004 to June 2005), burn patients had received an insulin drip protocol when their blood glucose levels exceeded 150 mg/dL.

The patients in each group had a mean age in the early 40s, and close to three-fourths in each group were men. The investigators excluded patients with concomitant trauma and burn injuries or desquamating skin diseases.

The control and intensive insulin therapy groups had similar blood glucose levels upon admission (142 mg/dL vs. 130 mg/dL, respectively) and in terms of daily average (135 mg/dL vs. 129 mg/dL) as well as overall mean during their hospital stay (127 mg/dL vs. 126 mg/dL). The intensive insulin-treated and control groups each spent a similar percentage of time in the hospital with a mean daily blood glucose level greater than 140 mg/dL (22% vs. 35%, respectively). But compared with patients in the control group, those who were treated with intensive insulin therapy spent a significantly lower percentage of their time in the hospital with a maximum mean daily blood glucose level greater than 200 mg/dL (11% vs. 17%).

In multivariate analyses that adjusted for age, gender, the percentage of total body surface area burned, and inhalation injury, adding intensive insulin therapy did not significantly improve the outcomes obtained in burn patients in the year before the therapy was implemented. There were no improvements in mortality (7% vs. 9%, respectively, among intensive insulin vs. control patients), mean length of stay in the ICU (5 vs. 9 days), mean length of stay in the hospital overall (10 vs. 17 days), and mean number of days requiring ventilation (3 vs. 6 days).

However, intensive insulin therapy significantly reduced rates of pneumonia overall (16% vs. 37%), ventilator-associated pneumonia (10% vs. 31%), and urinary tract infection (6% vs. 22%).

The odds of developing infection were more than 11 times higher in patients with a maximum mean glucose of greater than 140 mg/dL than in those with a maximum blood glucose level of 140 mg/dL or less. Of patients with maximum blood glucose levels higher than 140 mg/dL, 61 had an infection and 32 did not, whereas those with blood glucose levels of 140 mg/dL comprised 6 with infection and 53 without. Based on these values, a maximum blood glucose level greater than 140 mg/dL predicted the development of infectious complications, Dr. Hemmila said.

"Measurement of a blood glucose level greater than 140 mg/dL should heighten the clinical suspicion for presence of an infection in patients with burn injury," he concluded.

Dr. Peter J. Fabri of the University of South Florida, Tampa, a discussant at the meeting, noted a recent study suggesting that the complication rate of tight blood glucose control may actually negate its benefits (N. Engl. J. Med. 2008;358:125-39). "We have to be very careful being critical when we look at these studies," Dr. Fabri said. "It's very rare that one thing is the only thing that changes in a busy, successful critical care unit over a 2-year period of time." ■