

Low Braden scale scores predicted the development of pressure ulcers in neurologic intensive and intermediate care units

Fife C, Otto G, Capsuto EG, et al. Incidence of pressure ulcers in a neurologic intensive care unit. *Crit Care Med.* 2001 Feb;29:283-90.

QUESTIONS

For patients in neurologic intensive or intermediate care units, what are the risk factors for pressure ulcers, and can the Braden scale predict which patients will develop them?

DESIGN

Cohort study with follow-up to discharge from the unit.

SETTING

Neurologic intensive and intermediate care units of a primary care and referral university hospital with a level-1 trauma center in Houston, Texas, United States.

PATIENTS

186 patients (55% men, mean age 50 y for men and 61 y for women) admitted to the neurologic units. Exclusion criteria were a pressure ulcer of stage II (partial-thickness skin loss of epidermis or dermis, or both) or higher on initial assessment, discharge from unit < 24 hours after admission, brain death on life support pending organ donation, or no evaluation by nursing staff within 12 hours of admission.

DESCRIPTION OF PREDICTION GUIDE

The Braden scale has 6 categories with combined scores ranging from 6 to 23 points; a

higher score represents decreased risk. For sensory perception (ability to respond to discomfort), points are given for being completely limited (1), very limited (2), slightly limited (3), and unlimited (4). For moisture levels, points are given for constantly (1), very often (2), occasionally (3), and rarely (4) moist. For activity levels, points are given for being bedfast (1), being chairfast (2), walking occasionally (3), and walking frequently (4). For mobility, points are given for being immobile (1), being very limited (2), being slightly limited (3), and having no limitation (4). For observed nutritional intake, points are given for very poor (1), probably inadequate (2), adequate (3), and excellent (4) intake. For friction and shear, points are given for having a problem (1), a potential problem (2), and no apparent problem (3).

MAIN OUTCOME MEASURES

Ulcer formation from stage II to stage IV (full-thickness skin loss with extensive destruction; tissue necrosis; or damage to muscle, bone, or supporting structures).

MAIN RESULTS

Within 6 hours of admission, an initial assessment was done, and the Braden score was calculated. Assessment was repeated

every 4 days. 12% of patients developed pressure ulcers after a mean stay of 6.4 days; 68% of all ulcers developed within 7 days. All patients with ulcers had a Braden score ≤ 15 , and 20% of those with a Braden score ≤ 15 developed ulcers. Multivariate analysis showed that body mass index and the Braden scale were independent and predicted the development of pressure ulcers. Patients who had albumin levels ≤ 35 g/L, who had urine or stool incontinence, or who were bed-bound had approximately a doubling of risk for pressure ulcers.

CONCLUSIONS

The validity of the Braden scale as a predictor of pressure sores was confirmed in the neurologic intensive and intermediate care units. Determination of body mass index provided important additional information.

Sources of funding: In part, Hermann Center for Wound Healing, Memorial Hermann Hospital, Houston, Texas, and the Thomas D. Cronin Chair, Department of Plastic Surgery, University of Texas Medical School at Houston.

For correspondence: Dr. C. Fife, Department of Anesthesiology, University of Texas Health Science Center, 6431 Fannin, MSB 5.020, Houston, TX 77030, USA. FAX 713-500-6201. ■

COMMENTARY

Pressure ulcers are a common cause of morbidity in acute care hospitals and long-term care settings. Several professional organizations have developed prevention guidelines, and those produced by the U.S. Agency for Health Care Policy and Research (1) have been widely disseminated. The interventions recommended involve intensive nursing care and the use of pressure-reducing mattresses. The effectiveness of a thick foam mattress composed of individual removable cubes has been shown in 1 randomized controlled trial (2). Because these interventions may be uncomfortable for some patients and are costly, their use should be reserved for individual patients at higher risk.

The Braden scale is a prognostic instrument that has been validated in several settings. The results of the study by Fife and colleagues extend its validity to patients who are newly admitted to neurologic intensive and intermediate care units. A cut-off score of 13 is associated with a sensitivity of 91.3% and a false-negative rate of 8.7%. Cut-off scores of 16 to 19 had been suggested in other populations, perhaps because of more preexisting comorbid conditions.

A low body mass index was also predictive of pressure ulcers, an observation that has also been made in other settings. Attempting to optimize

nutritional status is common practice in this situation. Its effectiveness, however, has not been conclusively shown.

This study has important implications for clinical practice and is clearly written. The Braden scale is reproduced with sufficient detail for the uninitiated, and all the steps leading to the study's conclusions were meticulously explained. It could be cited to students as an exemplar for studies of instrument development and assessment for clinical prediction.

*Claudia Beghe, MD
James A. Haley Veterans Affairs Medical Center
Tampa, Florida, USA*

References

1. Agency for Health Care Policy and Research. Pressure ulcers in adults: prediction and prevention. *Clin Pract Guidel Quick Ref Guide Clin.* 1992;(3):1-15.
2. Hofman A, Geelkerken RH, Wille J, et al. Pressure sores and pressure-decreasing mattresses: controlled clinical trial. *Lancet.* 1994;343:568-71.