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


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 bedbound 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.

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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 uninstructed, and all the steps leading to the study’s conclusions were meticulously explained. It could be cited to students as an examplar for studies of instrument development and assessment for clinical prediction.

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References