Pressure Effects from the Military Stretcher

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SUMMARY: Attention is drawn to a possible deficiency in the folding pole canvas stretcher. Canvas tensioning and uniformity of support in the variety of stretcher where the canvas is attached by screws and metal strips was noted to be defective. High interface pressures were found on this type of stretcher, a problem not encountered in stretchers where the canvas tensioning is with regularly spaced tacks. Patients supported on the screw and strip variety may be at a higher risk of pressure necrosis.

Introduction

The folding, rigid pole stretcher (NATO 6530-99-138-8737) has proven itself to be a reliable support surface in the evacuation and treatment of casualties. Although not immediately obvious two varieties exist. The design of the stretchers allows the canvas to be attached to the wooden poles in two ways, by over folding the canvas and securing it by multiple flat headed tacks (about 3cm apart) or by holding the canvas with metal strips secured to the wood by screws (15cm apart). On a hospital exercise it was noted by a casually volunteer that the stretcher he was lying on had ridges (Fig 1) which dug into his body at regular intervals, causing areas of pain. The casualty was removed from the stretcher which was then carefully examined. It was off the strip and screw design. The canvas had loosened in the intervals between the screws and formed troughs. However, at the levels of the screws the canvas was still tensioned and produced ridges. These were the areas producing the discomfort for the casualty. It was decided to evaluate the two types of stretcher with reference to interface pressures.

Materials and Methods

A Talley pressure sensor (TALLEY UK) was attached to the skin overlying the sacrum in two subjects. Pressure readings were taken on the tacked and screw and plate stretchers at multiple levels. The pressure sensor was secured with medical tape to prevent movement. Interface pressure readings were taken at 15 minutes on both stretchers allowing body tissues and canvas to accommodate.

Results

The sacral interface pressures varied depending on the subjects' positions on the stretchers and the type of stretcher. The pressures at the sacrum when the sensor was over a ridge on the screw and strip stretcher was markedly elevated (subject one 138mmHg, subject two 104mmHg). There was a dramatic fall when the subjects moved on the stretcher to allow the sensor to lie in a trough (subject one 12mmHg, subject two 14mmHg). With the tacked stretcher the readings were uniform per subject on movement (subject one 43mmHg, subject two 38mmHg).

Discussion

It was apparent that most of the weight bearing support area in the screw and strip stretcher was provided by the ridges. The interface pressures at these areas approached or exceeded systolic blood pressure. Studies have shown (1, 2) that tissue perfusion may decrease at interface pressures above 30mmHg. Subjects placed on this stretcher will therefore be at more risk of pressure necrosis if wounded and immobile in a situation not allowing for regular turning. Spinally injured patients may have a risk of forming pressure sores of up to 59% (3) and any acutely ill patient 10% (4). A significant cause of morbidity.

It is possible that our stretcher was badly maintained...
Fig 2. A tacked canvas stretcher with uniform tensioning.

and that the canvas could be re-tensioned. However, time may not be available for this, and others in the stores were of similar condition. It would therefore appear that the tacked stretcher (Fig 2) may have advantages over the screw and strip stretcher as regards pressure care. It is advised that an eye should be cast over the conditions and tensioning of stretcher canvases at regular intervals.

REFERENCES
