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Sitting Pressure and Perfusion of Buttock Skin in Paraplegic and Tetraplegic Patients, and in Healthy Subjects: A Comparative Study

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Abstract:

The distribution of sitting pressure and ability to respond with reactive hyperaemia were studied in a group of paraplegic and tetraplegic patients ($n = 8$) with spinal cord lesions and healthy controls ($n = 10$) using a pressure sensitive plate and laser Doppler perfusion imager. The results show that the mean sitting pressure of the patients was 9.9 N/cm^2 (left) and 11.7 N/cm^2 (right) compared with 3.5 N/cm^2 controls. The differences were significant on both the left ($p < 0.01$) and right ($p < 0.05$) sides. The maximum pressure in patients was 42.9 N/cm^2 (left) and 48.7 N/cm^2 (right), and in controls ($p < 0.01$). Both groups showed a reduction in skin perfusion in the seat area during sitting compared with unloaded resting, and in the controls it was significantly increased ($p < 0.001$ on both sides) during the reactive hyperaemic phase immediately after sitting. Compared with the preload values, the patients showed a similar but slightly weaker picture significant on the right side ($p < 0.05$), but not on the left. The hyperaemia was not uniformly distributed, but occurred where the pressure was greater than 2 N/cm^2 . There was no correlation between the amount of reactive hyperaemia and absolute values of sitting pressures. We conclude that tetraplegic and paraplegic patients have significantly higher sitting pressures than normal controls, and that the hyperaemic response in the buttock region in the upright position after pressure load is slightly weaker in the patients, which could be of importance for the development of decubitus ulcers.

Keywords: [REACTIVE HYPERAEMIA](#); [PARAPLEGIA](#); [TETRAPLEGIA](#); [SITTING PRESSURE](#); [DECUBITUS](#); [ULCER](#); [LASER DOPPLER PERFUSION](#); [IMAGING](#).

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