

SACRAL SKIN BLOOD FLOW IS LARGER THAN OTHER POSTERIOR SITES

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Purpose/Rational: Pressure ulcers occur over the sacrum but rarely over the gluteus maximus. This predilection is partly due to pressure concentration effects but other factors may be involved. We hypothesized that if resting sacral skin blood flow (SBF) was larger than in surrounding areas, then blood flow stoppage during bed-lying loading might increase risk due to a greater relative SBF deficit. As data on sacral SBF is scarce, our first step was to characterize its features in comparison to other skin areas.

Methodology: SBF was measured by laser Doppler imaging (LDI) in 15 cm² areas overlying the sacrum in 30 subjects (15 male) and compared to SBF in posterior sites (gluteus and lower back) and remote sites (hand and fingers). LDI is a non-contact form of laser-Doppler perfusion monitoring with the major advantage of large area sampling.¹⁻²

Results: Median SBF for sacrum, gluteus and lower back were 59.6, 51.3, and 46.9 a.u. respectively with the sacrum SBF significantly ($p < 0.001$) larger than each of the other posterior sites. Sacral SBF was also larger in females (63.0 ± 1.6 vs. 55.2 ± 1.8 , $p < 0.01$).

Conclusion: These results provide the first systematic characterization of resting sacral SBF. The findings are consistent with the hypothesis that reduction in its relatively higher flow may play a role in sacral skin breakdown. There are several other possible implications related to conditions in which compensatory hyperemia in relation to deprivation of a prior higher basal flow might be inadequate. One relates to person's in whom vasodilatory capacity is blunted due to microvascular or other deficits. This includes persons with diabetes, the aged and those with systemic hypotension. Another relates to persons who have experienced an abnormal increase in resting blood flow attributable to prior bed lying, skin heating or other skin related conditions such as localized irritation. Though these persons may have a vasodilatory blood flow capacity adequate to meet their normal resting repayment blood flow needs after intervals of flow deprivation, they may not have adequate hyperemic reserve to meet the imposed increased blood flow demands of elevated basal flow. Based on these considerations, it would seem to be prudent to at least consider the possible role of resting SBF as possible added risk component and to consider factoring this concept in to patient care strategies.

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References:

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