PLASMA LEVELS OF ARGININE AND LACTATE IN REHABILITATION PATIENTS WITH SPINAL CORD INJURY AND PRESSURE ULCERS

Verri Manuela*, Aquilani R.^, Boschi F.*, Dossena M.*, Iadarola P.°, Viglio S.°, Pastoris O.*

*Department of Physiological & Pharmacological Sciences; °Department of Biochemistry "A. Castellani", University of Pavia, Pavia, Italy; ^IRCCS "S. Maugeri" Foundation, Montescano, Italy

Background: Patients with spinal cord injury (SCI) are particularly prone to develop pressure ulcers (PU); nutritional status is an independent risk factor for the development of PU. Some studies in humans suggest the usefulness of the amino acid arginine supplementation for the healing of PU (1). **Aims**: To evaluate plasma arginine level in patients with post-traumatic SCI and establish whether their current metabolic orientation (indicated by plasma lactate level) could contribute to diminish its concentration. **Patients and methods**: n=13 SCI patients (43±17 yrs) were enrolled for the study at admission to the rehabilitation institute 28±28.6 days after acute trauma; seven patients had PU. N=20 healthy men served as controls. Venous blood samples were taken from the antecubital vein to determine plasma levels of total amino acids (although we focused on arginine only), expressed as mmol/l, and lactate (expressed as µmol/ml). All patients were on oral alimentation and a nutritional analysis was made. **Results:** SCI patients (with or without PU) had lower plasma arginine concentrations (71.2±27, $P<0.03$) than controls (102.8±28), and an insufficient nutrition to ensure a positive or in equilibrium nitrogen balance (NB). Regarding body metabolic orientation, plasma lactate concentration was higher in patients with SCI (1.003±0.318, $P<0.0001$) than in controls (0.212±0.193). **Conclusions**: Based on the physiological role of arginine, patients with SCI are at increased risk for developing new PU and delaying the healing of the existing ones. Moreover, current metabolic orientation (increased production of cell lactate) is such that to contribute to lower plasma arginine. This finding indicates the existence of difficulties in glucose aerobic metabolism suggesting an increased utilization of alternative substrates such as amino acids. To this purpose, we believe it is preferable to optimize/increase the amount of protein ingestion in SCI patients, rather than to provide arginine as a single specific pharmacological substance. In fact, arginine is metabolized to nitric oxide (NO) that elicits a primary protective role in wound healing; in chronic wound, however, the role of NO has not yet been elucidated. This is an important issue, as a possible persistence of NO production after the first days of skin insult may result detrimental for wound healing.

References

1. Kirk SJ, Hurson M, Regan MC, Holt DR, Wasserkrug HL, Barbul A. (1993) Surgery; 114: 155-159.