Calf hemodialysate: nutritive value plus placebo effect

Highly purified calf hemodialysate (HPCH), known as Actovegin or Solcoseryl, has been proposed as a medication for certain neurological and other diseases. For example, Actovegin was reported to have beneficial effects on cognitive performance in patients with cognitive impairments after stroke; it was also prescribed for the treatment of peripheral arterial disease and diabetic polyneuropathy. Actovegin is a deproteinized hemodialysate manufactured from calf blood by ultrafiltration; it is permitted for clinical use in some Asian and European countries.

A hypothesis is discussed here that reported effects of HPCH are caused by its nutritive value and placebo effect. HPCH is a mixture of normal serum components so that a specific action can hardly be expected. Probably, bovine blood has been chosen not because of its special features but due to economical reasons and lack of disapproval associated in some cultures with porcine products. HPCH contains oligopeptides, amino acids, nucleotides, microelements etc., thus having a nutritive value. The recommended dose around 2 g/day would not add much to the whole body nutrition, but if injected intravenously it may produce an immediate effect especially in conditions of protein-energy undernutrition.

Apart from its nutritive value, HPCH probably exerts a placebo effect, the more so as many studied features were subjective (cognition, perception etc.) and evaluated by questionnaires. It is known that placebo may affect subjective perception of symptoms. By repeated injections of HPCH, the immediate nutritive and placebo effects would reinforce each other, that is, act synergistically according to the mechanism of Pavlovian conditioning. As for the oral intake, beef contains the same substances as HPCH, especially if not overcooked. Oligopeptides and amino acids are preferable nutrients for diabetics, which may contribute to the favorable action of HPCH reported in people with diabetes. HPCH and some other meat-derived substances having a nutritive value (carnosine, taurine) are consumed by athletes; but HPCH has proven itself neither ergogenic nor influenced functional capacity in exhaustive tests. HPCH applied topically was reported to be of benefit for the healing of wounds and skin lesions caused by ionizing radiation. The underlying mechanism could be a supply of nutrients for regenerating tissues. The nutritive value of HPCH might also explain reported beneficial effects after a hypoxic brain injury in rats and in neurons cultured from embryonic rat brains. It is not surprising that added serum components contribute to the viability of cell cultures as sera are used as ingridients of cell culture media. A favorable effect of HPCH in stroke patients may be seen as a consequence of nutritional supplementation, which is known to reduce morbidity and mortality after stroke. Reported favorable effects of HPCH as well as of other meat-derived substances such as carnosine and taurine in patients with dementia, mental and neurological disorders should be further studied as possible markers of malnutrition and protein deficiency e.g. among inhabitants of homes for the aged and psychiatric facilities. Malnutrition is known to be associated with impaired cognition. Further experiments should compare HPCH with other nutritive substances e.g. homologous serum, meat broth or preparations for parenteral nutrition containing amino acids and oligopeptides.

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