INSULIN LIKE GROWTH FACTOR 1: ANTLER STIMULATING HORMONE?

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Insulin like growth factor 1 (IGF-1) one of the two major somatomedins has recently been shown to restore growth in hypophysectomised rats (Schoenle et al. 1982). There is evidence that IGF-1 level and extent of post natal growth are related (Merimee et al. 1981). Antlers are cranial organs grown annually by male deer. The antlers grow by a process of endochondral ossification from permanent boney pedicles which develop as a secondary sexual character during the first year of life. When growth is complete the skin (velvet) surrounding the antler dies and "clean" dead bone, which is cast before subsequent antler growth commences, remains. The control of antler growth rests largely with androgens but putative antler stimulating hormones (e.g. prolactin, Wislocki et al. 1947) have been evoked. As IGF-1 is known to stimulate cartilage synthesis the aim of the present study was to investigate a possible role for IGF-1 as "antler stimulating hormone".

At monthly intervals from 3 to 12 months of age 6 red deer stags penned individually and fed to appetite, were blood sampled via a cannula inserted into the jugular vein. The resultant plasma was stored at -20°C until assayed for IGF-1 by the method of Gluckman et al. (1983). Values are expressed as u/ml, where 1 unit is the value of 1 ml of a pool of plasma from 4 yearling stags outside the antler growing season. In addition antler length was measured with a flexible tape at regular intervals.

| | Antler Development | | |
|---|---|---|---|
| | Pre-Pedicle and Pedicle | Antler | Antler Complete |
| IGF-1 | 0.43 ± 0.04 | 2.89 ± 0.52 | 1.24 ± 0.34 |
| n | 37 | 12 | 4 |

Table 1. IGF level at 3 stages of development of the first antler. (unpaired 2-tailed t-test)

The level of IGF-1 was greater both during and after antler growth compared with pre-pedicle and pedicle growth ($p<0.001$ and $p<0.05$, respectively). The level of IGF-1 was greater during antler growth than after ($p$ 0.02).

It thus appears that IGF-1 a hormone known to be involved with cartilage synthesis is elevated in association with antler development. It is tempting to equate IGF-1 with "antler stimulating hormone" but this must await further study and analysis.

References

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