LIVEWEIGHT GAIN AND INSULIN LIKE GROWTH FACTOR 1 (IGF1) LEVELS IN TESTOSTERONE TREATED STAGS

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There is evidence from dogs that body size and plasma IGF1 levels are correlated (1) and evidence from deer that growth velocity of antlers is related to IGF1 (2). Steroid hormones administered to deer during spring when IGF1 levels are high can increase growth rate by 20% (Fennessy and Moore, pers. comm.). The aim of the present study was to determine whether IGF1 levels were altered in stags whose growth was manipulated using testosterone implants.

Thirty one 20 month old red deer stags were kept at pasture. On 26 October they were allocated randomly to one of 4 treatments:- a) control (T_0) one empty 30 cm silastic tube (Dow Corning Ltd) (3) (n = 8), b) low testosterone (T_1) one 30 cm silastic tube packed with testosterone (Sigma Chemicals Ltd) sealed with silastic adhesive (n = 8), c) medium testosterone (T_2) two 30 cm implants (n = 8), d) high testosterone (T_4) four 30 cm implants (n = 7). The implants were placed subcutaneously in the neck under general anaesthesia. Blood samples were withdrawn fortnightly and each animal was weighed. The trial closed 53 days later on 17 December. Testosterone was measured by radioimmunoassay (4) as was IGF1 (5).

Group	Testosterone (ng/ml)	Liveweight Gain (g/day)	Adjusted IGF1 (ng/ml)
T_0	0.18^{a}	203^{a}	142.0^{ab}
T_1	0.29^{a}	205^{a}	122.5^{b}
T_2	0.54^{b}*	264^{b}*	154.2^{ab}
T_4	1.23^{c}*	264^{b}*	160.9^{a}*
LSD	0.217	30.1	33.2

Table 1: Mean plasma testosterone, liveweight gain and IGF1 adjusted for liveweight gain over the 63 day trial. Means with different superscripts are significantly different (*$p < 0.05$).

The testosterone implants raised the level of plasma testosterone in a dose dependant manner although the T_1 group did not differ significantly from T_0. The T_2 and T_4 groups grew significantly faster than the T_0 or T_1 groups. Both these groups had elevated IGF1 levels although only the T_4 group was significantly greater than the T_1.

Clearly rapid steroid-induced growth is associated with high IGF1 levels. It could be that IGF1 is partly involved with mediating the growth promoting effects of steroids in deer.

References

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