

Effect of Androgens on the Brain and Other Organs During Development and Aging

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Abstract

Androgens have important biological effects on accessory sexual organs and have a broad range of effects on metabolic processes. Male hormones have been shown to have important organizational and activational effects on morphological, behavioral, and cognitive activity in experimental animals. Sexual dimorphic effects on cognitive and behavioral activities in animals have been linked to androgens during the fetal period. The effects of testosterone on sexual drive are well established in humans, although the threshold for such activity appears to be lower than that required for many of the other and organic effects of testosterone. There are suggestive data to link fetal androgen levels to cognitive and behavioral activities in children and adults, but the behavioral activities may be modified by social and other learning processes.

Androgen levels fall in older men at a time when impaired sexual function, osteopenia, and decreased muscle mass can be identified. The relative importance of androgen deficiency in these disorders requires further study, since they are likely to be multifactorial in pathogenesis.

Replacement therapy of elderly men who have lowered testosterone levels have been proposed to decrease bone and muscle loss as well as to improve sexual function and general well-being. Careful studies will be required to assess the risk-to-reward ratio of such treatment, since theoretical adverse effects on prostate and cardiovascular diseases may occur. While conservation in management has its virtues, we should be reminded that several decades ago estrogen replacement of post-menopausal women was highly criticized until data supporting its favorable therapeutic ratio were demonstrated.
