

index (BMI) was calculated using height and weight.

Results: The BMI distribution was balanced for men with inguinal hernias among all age groups. TE2 was low in 23.7%, normal in 65.8%, and high in 10.5% of men 50 years or younger. In contrast, the percentage of patients with high TE2 was increased 2.6-fold in men over the age of 50 (20.1% in low, 52.3% in normal, and 27.6% in high). TT was normal in all men 50 years and younger but was low in 3.5% and normal in 96.5% of men over the age of 50. We found that serum TE2 levels and the ratio of TE2/TT positively correlated with age ($p=0.001$). In addition, serum TE2 levels were significantly higher in the advanced age groups (71-80 and 81-90 years) than in the young age group (20-40 years). Serum TT levels decreased but did not reach significance in the advanced age groups compared to the young age group. Remarkably the ratio of E2/T was higher in the advanced age groups than in the young age group (20-30 years). Serum DHEA levels in men over the age of 50 were significantly higher than in men 50 years or younger. SHBG levels were higher in men over 70 years than men 50 years or younger ($p < 0.01$). Serum levels of FSH and LH in men over 60 years were 3-fold greater than in men 50 or younger ($p < 0.01$).

Conclusions: Our findings suggest a correlation of increased estrogen action in the formation of inguinal hernias at an advanced age. This points to a potential utilization of inhibitors of estrogen synthetase or estrogen antagonists in a subset of elderly inguinal hernia patients with increased circulating estrogen as a non-surgical intervention.

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Steroid Hormones and Receptors

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Sex Hormones, Sex Hormone Binding Globulin, and Gonadotropins in Men with Inguinal Hernias

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Background: More than 1 in 4 men will undergo inguinal hernia repair during their lifetime. Age is a significant risk factor for inguinal hernias in men with increased incidence in older age. Sex steroid hormone changes are observed with a higher ratio of serum estradiol (E2) to testosterone (T) as men age. We previously demonstrated that a shift from androgen to estrogen action caused inguinal hernia formation in a transgenic male mouse model with increased estrogen action in lower abdominal muscle tissues. However, age-related changes in serum E2 levels in men are conflicting, as some studies have reported increases but others have noted unchanged or even decreased E2 levels with advancing age.

Method: This study was performed on 212 men with inguinal hernias, aged 20 to 90 years, stratified at 10-year intervals of age (20-30, 31-40, 41-50, 51-60, 61-70, 71-80, 81-90 years). We assessed total T (TT), total E2 (TE2), dehydroepiandrosterone (DHEA), sex hormone-binding globulin (SHBG), and gonadotropins (FSH and LH). Body mass