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Effects of liver disease and transplantation on the human prostate

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A major determinant of late-life prostate diseases is hormonal exposure during earlier life, but the effects of androgens in midlife on the human prostate have been little studied. In order to identify hormonal effects on the prostate during the long latent period of midlife, we studied the effects of chronic androgen deficiency on the prostate during midlife by examining men with severe liver disease before and after liver transplantation. Patients (n = 15, median 57, range 38-65 years old) with severe liver disease but no known prostate disease being evaluated for liver transplantation underwent 21 prostate ultrasound studies, 12 prior to and 9 after liver transplantation, with six men undergoing both studies. Controls were 42 prostate ultrasound studies (2:1 matching) from age-matched healthy men. Total- and central-prostate volumes were measured with a 7.5-MHz biplane transducer planimetrically at 2.5-mm intervals with a stepper device from base to apex of the prostate. Overall, total- and central-prostate volumes were not significantly different between patients with chronic liver disease before and after liver transplantation and age-matched healthy controls. This appeared to be due to a bimodal distribution, with most men (12 men, 17 studies) having smaller prostate volumes and a minority (3 men, 4 studies) having previously undiagnosed, macroscopic, benign prostatic hyperplasia. The reduction in prostate volume prior to transplantation was significantly correlated with severity of liver disease (Child-Pugh score). Before liver transplantation, prostate-specific antigen (PSA) concentrations were significantly lower and prostatic acid phosphatase increased, and both were normalized after liver transplantation. Plasma testosterone concentrations were decreased before transplantation and remained low after transplantation. Sex hormone-binding globulin level was significantly elevated before and reduced to subnormal after liver transplantation. Estradiol concentrations were unchanged by liver disease or transplantation. We conclude that prostate volumes, particularly that of the central zone, are usually reduced by the functional androgen deficiency of chronic liver disease and tend to be restored toward normal by liver transplantation, depending on the degree of rectification of circulating plasma testosterone concentrations. Prostate glands with established benign prostatic hyperplasia may be less responsive to these hormonal changes.

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