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## Liver iron overload is associated with elevated SHBG concentration and moderate hypogonadotropic hypogonadism in dysmetabolic men without genetic haemochromatosis

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### Abstract

**Aims:** To assess the relation between moderate iron overload on sex hormone binding globulin (SHBG) levels and gonadotroph function in men with dysmetabolic iron overload syndrome and the effects of phlebotomy.

**Methods:** The relationship between magnetic resonance imaging assessed liver iron concentration (LIC) and plasma ferritin levels with total testosterone, bioavailable testosterone (BT), SHBG and LH levels, were studied in 50 men with moderate dysmetabolic iron excess, in the absence of genetic haemochromatosis, who were randomised to phlebotomy therapy or to normal care.

**Results:** Four patients (8%) had low total testosterone (<10.4 nmol/l) and 13 patients (26%) had low BT (<2.5 nmol/l). In the entire population, those with LIC above the median (90 µmol/l) had a higher mean SHBG (P=0.028), lower LH (P=0.039) than those with LIC below the median. In multivariable analysis (adjusted for age, and fasting insulin) LIC was significantly associated with SHBG (positively) and LH (negatively). Patients in the highest quartile of SHBG had higher LIC (P=0.010) and higher ferritinaemia (P=0.012) than those in the three other quartiles. Iron depletion by venesection did not significantly improve any hormonal levels.

**Conclusions:** Hypogonadism is not infrequent in men with dysmetabolic iron overload syndrome. Liver iron excess is associated with increased plasma SHBG and moderate hypogonadotropic hypogonadism. Phlebotomy therapy needs further investigation in symptomatic hypogonadal men with dysmetabolic iron excess.

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