

Benign prostatic hyperplasia due to venous drainage malfunction in the male reproductive system: a price of erect posture in humans

Ever since the discovery of hormones and their target organs, benign prostatic hyperplasia (BPH) has posed a paradox. In the face of age-related deterioration of circulating testosterone levels, the prostate undergoes a process of enlargement.

The seminal observations by Gat *et al.*, appearing in the current issue, revolutionise our view of BPH and its pathophysiology. They found that in ageing men, the drainage apparatus of the reproductive system is impaired due to physical wear and destruction of the one way valves in the internal spermatic veins. This results in crucial changes in intravascular and interstitial pressure and blood flow in the entire reproductive system, creating elevated venous back-pressure associated with back-flow of venous blood, affecting the prostate. It also exposes the gland to extremely high concentrations of biologically active, free testosterone from a new, additional, previously unrecognised source, directly from the testes. So, in addition to the physiological androgen arriving via the arterial blood, the gland is flooded with high concentrations of biologically active androgen some two orders of magnitude above normal, reaching it via the testicular and prostate drainage systems – the ‘back door’.

Thus, in light of their previous work, which showed that the prevalence of varicocele increases with age, BPH is no longer to be considered paradoxical in ageing men. Rather, it is to be expected.

Furthermore, by occluding the internal spermatic veins bilaterally including the associated network of venous bypasses, which are vertically oriented, they achieved a dramatic reversal of BPH, further supporting the direct role of the reversed venous flow from the testes to the prostate. They explain the overall diminished production of testosterone in older men as the result of relative testicular hypoxia caused by the impairment of the testicular venous drainage system. This has been demonstrated by histological findings and their previous observations on improvement in testosterone production in men with infertility and low testosterone levels.

Epidemiological and evolutionary perspective

Humans differ from most placental mammals in their erect posture. Our posture has provided well-known evolutionary advantages. Yet, bipedalism has several disadvantages, too (such as backache). According to the present study, BPH seems to be a part of the ‘price’ we pay for our advantageous posture. Another part of the ‘price’ which should be mentioned is male infertility. In previous studies, Gat *et al.* demonstrated that in nearly 90% of male infertility cases one can demonstrate malfunctioning of the testicular venous drainage system, which is directly related to our erect posture. This corroborates with the absence of varicocele in quadruped mammals.

Future prospects

The study by Gat *et al.* has several potentially powerful medical ramifications. Firstly, as in the discovery of the bacterial aetiology of peptic ulcer (*Helicobacter*), it could relegate a number of sophisticated surgical techniques to historical anecdotes. The savings in hospitalisations, the surgical as well as indirect costs would be enormous. Secondly, if varicocele predisposes to later age prostatic pathology, the best strategy would be to establish criteria for preventive treatment by interventional radiology. Thirdly, restored circulating testosterone levels in ageing men by their treatment could ‘naturally’ revive sexual function.

It will be exciting to observe corroboration of this study’s findings and their future effect on medical practice.

W.-B. Schill
Editor-in-Chief,
Giessen, Germany

I. Ben-Shlomo
Maayanei HaYeshua Medical Centre,
Bnei Brak, Israel