Prevalence of Gonadal Dysfunction in Patients with Chronic Kidney Disease at a Tertiary Care Centre

Dear Editor,

Hypergonadotropic hypogonadism is a well-described hormonal derangement associated with chronic kidney disease (CKD), also known as Uremic Hypogonadism. The objective was to assess the prevalence of gonadal dysfunction associated with CKD and to study the co-relation of gonadal dysfunction with disease severity.[1,2]

In this cross-sectional study, a total of 50 patients (male and female) with CKD were included during the 1 year period from May 2015 to April 2016. The patients were selected from the Ward and OPD department of General Medicine as well as the Endocrinology clinic at Calcutta National Medical College and Hospital, and clinical and biochemical parameters related to gonadal dysfunction were evaluated in these cases. The immunological profile comprised of follicle-stimulating hormone (FSH) and luteinizing hormone (LH) levels, along with serum levels of Testosterone and Estradiol. The recorded data was analyzed by SPSS (Statistical Package for Social Sciences) version 16.0 IBM and a Chi-square Test was applied for Non–parametric data comparison. A value of $P \leq 0.05$ was considered as statically significant.

The mean age of patients in the study was 52.27 ± 14.56 years. Of the 28 male patients, 24 patients had a lower than normal Serum Testosterone levels [Table 1]. These findings were in accordance with a study done in 2008, which showed that 50-70% patients with end-stage renal disease (ESRD) had severe gonadal dysfunction with low testosterone levels.[3] The levels of Serum Estradiol were found to be decreased in 14 of 22 female patients; levels lower in stage 5 CKD patients as compared to those with Stages 3 and 4 CKD. These findings were similar to a previous study done in 144 patients, where low levels of serum Estradiol were seen in patients with ESRD.[4,5]

High levels of Serum LH were seen in 18 of 28 Male patients and in 12 of a total of 22 female patients. High levels of serum FSH were found in 19 male patients, and in 20 female patients. These results were in accordance with previous studies done in 1982 and 1993, which similarly showed an increase in FSH and LH levels in Stage 5 CKD patients.[4-6]

16 among the 28 male patients and 18 among the 22 female patients were on treatment by hemodialysis. According to a similar study[7] conducted in 1975, 45% subjects had reduced gonadal function before starting treatment with dialysis, 30% had reduced gonadal function after dialysis, and the rest 25% had normal gonadal function. Those patients having reduced gonadal function had serum LH and FSH levels greater than normal, along with decreased libido.

In this study, 34 of 50 CKD patients showed evidence of gonadal dysfunction. The number of patients having gonadal dysfunction increased with the progressing stages of CKD i.e., 5 patients in Stage 3 CKD, 11 in Stage 4 CKD and 18 in Stage 5 CKD/ESRD, which shows a statistically significant association ($P = 0.02$). Similar studies were done in 1979 and 1997, showing majority of CKD Stage 5 patients with menstrual irregularities due to hypogonadism.[8]

In this present study, we found decreased levels of Serum Testosterone and Serum Estradiol, along with increased levels of serum LH and serum FSH in CKD patients, which suggests that these abnormal hormonal levels might be substantially influenced by the progression of CKD. There were some limitations in this study, such as the lack of a proper sexual history given by patients and a small sample size. Since this was a cross-sectional hospital-based study, further studies are still needed to study gonadal dysfunction in these patients.

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Conflicts of interest

There are no conflicts of interest.

Table 1: Comparison of Age and Levels of Gonadal hormones in various stages of CKD

Criteria	Stage 3 and 4 CKD	Stage 5 CKD/ESRD	*P*
Age, mean±SD (years)	40.37±9.46	63.34±12.67	0.02
Serum Testosterone (ng/dl) (Males)	94.45±44.23	72.86±13.90	<0.001
Serum Estradiol (pg/ml) (Females)	75.77±43.28	34.57±5.58	0.04
Serum LH (mIU/ml) (Males)	7.56±1.42	17.16±3.57	0.01
Serum LH (mIU/ml) (Females)	56.33±15.55	116.78±5.32	0.002
Serum FSH (mIU/ml) (Males)	15.87±6.65	26.45±8.62	0.04
Serum FSH (mIU/ml) (Females)	28.86±7.72	38.80±8.86	0.013

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