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## **Another Hormone Produced in the Kidney: Gonadopoietin**

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### **ABSTRACT**

*Objective: observation based clinical literature to investigate the level of sex hormone and sexual dysfunction in patients with uremia, manifestation and associated factors. Methods: comprehensive evaluation on from a large number of published data, a cross-section study was conducted by documents retrieval. As opposed sex hormone of health cases contrast to uremia, patients with uremia before and after hemodialysis, patients underwent renal transplantation and sexual function change in normal volunteer after drinking fresh urine. Results: The levels of sexual hormone in patients with uremia are significantly lower than those in normal controls, there is no significant alteration of the sexual hormone secretion before and after hemodialysis in patients with uremia, the sexual hormone of patients underwent renal transplantation is higher than that in normal and increased International Index of Erectile Function-5 (IIEF-5) after normal person drinking fresh urine. Conclusions: another hormone secreted by kidneys, we are calling this hormone “gonadopoietin” for want of a better name.*

### **Key Words**

Uremia; Sexual dysfunction; Related factors; Renal transplantation; Gonadopoietin

The kidneys are excretory organ not only of the body, but of the important place to endocrine. The kidneys are not targets of hormone action, but it also synthesize, regulate and secrete hormone, influencing non-renal function, such as erythrocyte formation and bone metabolism. The presently known hormones secreted by the kidney are rennin, angiotensin, prostaglandin, kallikrein, endothelin, urodilatin, eicosanoids, 1 $\alpha$ -hydroxylase, erythropoietin and so on. There are various indications in clinical observations that kidney also produces hormone associated with sexual hormone production, we are calling this hormone “gonadopoietin” temporarily.

Sexual disorder is common in patients with uremia. Sexual discontent, sexual disorder have been an important problem for affected on patients' living quality. Sexuality were still tremendous effect in quality of life even after correct patients' age, sex and affects quality of life other variables<sup>[1]</sup>. For this reason, we adopted the literature textual criticism, comprehensive evaluation on patients' with uremia sexual hormone level and sexual disorder, search for indirect evidence of gonadopoietin.

## 1 Materials and Methods

1.1 Clinical Materials All the data were from literature retrieval.

1.2 Methods As opposed sex hormone of health cases contrast to uremia, patients with uremia before and after hemodialysis and patients underwent renal transplantation comes from documents. Sexual function change in normal volunteer after drinking fresh urine is up to author to complete the work. Utilizing International Index of Erectile Function-5 (IIEF-5) to measure sexual function change.

Tab 1. International Index of Erectile Function-5 (IIEF-5)

integral	evaluation
5-7	serious ED
8-11	moderate ED
12-21	mild ED
≥22	no ED

## 2 Results

Mean testosterone (T) and estradiol (E<sub>2</sub>) were also significantly lower in patients with uremia than those in the healthy subjects<sup>[2-6]</sup>.

Tab 2. Comparision of serum PRL, T, E<sub>2</sub>, FSH, LH between 32 male patients with CRF and normal control (x±s)

CRF	Normal	P	
PRL	78.8±58	11.7±4.0	<0.01
T	8.1±6.0	24.3±15.9	<0.01
E <sub>2</sub>	27.2±19.5	49.8±5.2	<0.01
FSH	21.8±2.9	24.1±4.4	>0.05
LH	27.8±27.7	18.0±4.5	>0.05

There were patients with uremia sexual hormone without significant effect after hemodialysis<sup>[7-13]</sup>.

.Tab 3. Change of serum sexual hormones after hemodialysis in men patients with uremia (x±s)

group	T (μg/L)	PRL (mIU/L)	FSH (IU/L)	LH (IU/L)	E <sub>2</sub> (ng/L)
control group	6.8±2.3	258±36	6.9±2.4	5.6±1.9	29.6±15.3
uremia group					
before hemodialysis	3.6±1.91▲	897±2561▲	21.9±4.51▲	18.6±3.71▲	96.1±20.31▲
3 month after dialysis	3.8±2.31▲	857±2491▲	22.7±5.91▲	17.7±4.21▲	91.4±19.81▲
6 month after dialysis	5.6±2.11▲■	478±2371▲■	14.6±4.81▲■	13.7±4.31▲■	67.7±26.71▲■
12 month after dialysis	3.7±2.4	759±286	19.9±6.3	21.5±4.7	87.6±22.3

注: ▲P<0.05 compared with the normal group; ■P<0.05 compared with the after hemodialysis

There is no significant difference of sexual hormone between healthy subjects and patients underwent renal transplantation<sup>[14-15]</sup>.

Tab 4. Change of serum sexual hormones after kidney transplantation in men patients with uremia (x±s)

detected time	PRL (μg/L)	LH(IU/L)	FSH(IU/L)	T(nmol/L)
normal group	6.76±0.84	9.76±3.85	8.17±4.71	23.34±3.95
preoperation	36.45±7.36▲	33.16±31.81▲	19.38±6.43▲	13.87±2.89▲
1 month after operation	19.57±2.15	23.47±10.95	18.31±7.98	18.87±3.78
3 month after operation	15.71±1.98	19.21±9.74	16.54±7.34	21.04±4.65
6 month after operation	13.68±1.32■	17.21±5.86■	14.97±6.97■	21.75±2.87■

▲: P<0.01 compared with the normal group; ■: P<0.01 compared with the after operative group

After normal person drinking fresh urine has the power against sexual disorder<sup>[16]</sup>. Author (the age of 55) experience personally urotherapy efficacy in which drank 52-year-woman the first fresh urine in the morning for three consecutive months and IIEF-5 has risen from 13 points to 18. Moreover, erection of penis was very powerful before morning, the angle between the erectile penis and abdominal wall less than 45 degrees and duration of erection longer than 1 hours. But the above phenomena tailed away after interrupt drank urine three days.

Tab 5. Comparision of IIEF-5 before and after normal person drinking fresh urine

detected time	integral
before drinking fresh urine	13
after drinking fresh urine for 3 months	18

### 3 Discussion

Sexual hormone deficiency is a clinical syndrome in which the predominant feature are: i. hyposexuality and erection dysfunction, especially nocturnal erection; ii. mood changes accompanied by mental and spatial disorientation, tend to fatigue, irritated and gloomy; iii. lean body mass (LBM) taper drop off accompanied by muscle mass and muscle weakness; iv. body hair diminishes and skin change; v. bone mineral density (BMD) reduced in which causes osteopenia and osteoporosis; vi. visceral fat deposition. The typical symptoms of patients with uremia sex functional disorder were hyposexuality, erection dysfunction (ED) and premature ejaculation.

Patients with uremia have lower sexual hormone levels that shortage of Gonadopietin is the main cause

of the sex functional disorder, which were not related to patients' disease course, creatinine clearance rate (Ccr), parathormone (PTH) and plasma albumin. Traditional ideas are that patients with uremia having lower sexual hormone levels is due to uremic toxins, but there is increasing clinical observations that hemodialysis cannot possibly improve sex functional disorder of patients with uremia<sup>[16]</sup>. There was no evidence of different for various forms of sexual dysfunction rate and the dysfunction of the crisis between hemodialysis and peritoneal dialysis. Be compare with dialysis groups (hemodialysis and peritoneal dialysis), non-replace therapy group, kidney transplantation group, we can find that the incidence of ED of non-replace therapy group and dialysis groups were higher than that of kidney transplantation group. Lindhalm et al. observed the changes of male-female pituitary hormones after kidney transplantation and sexual hormone state, he put forward the successful post-renal transplantation recovered to the normal at 2 weeks and 6 months<sup>[17]</sup>. This fully indicates that the toxins from the body were beside sexual hormone. Sexual hormone of post-transplantation were slightly higher normal, caused perhaps by the lack of gonadopoietin over a prolonged period, as soon as “supply” is recovered, sexual hormone levels frequently have feedback physiological increased. Drinking urine take effect on improving ED<sup>[18-20]</sup>. Healthy persons were selected indicators of men after the age of fifty in significant decrease of sexual function, was targeted at drinking fresh urine of the post-menopause, clearing influence of sexual hormone. IIEF-5 score increased after drinking fresh urine show that gonadopoietin by the renal secretion is not influenced by sex.

It's like a supposed fact of dark matter existence by astronomical observation, gonadopoietin has come to a deep understanding through long years of clinical practice. Review the Artrial Natriuretic Polypeptide (ANP), is present throughout the cognitive leaps achieved that is deepened and broadened by the hypothesis. The discovery of ANP is said to be begun from hypothesis that heart has the endocrine function, but the hypothesis construction and prove came through 35 years set-up procedure of objective facts and theory.

It should be noted that the hormone manufactured and excreted by kidneys, we can read gonadopoietin only a few. Up to now, gonadopoietin determination methods have not yet established, there is no morphology and biochemistry evidence, found no gonadopoietin receptor. It remained a enigma in structure and formula. So that this problem will need to be further gone into if gonadopoietin can be a hormone excreted by kidneys.

Albert Einstein asked: “ask a question is often more important than solving a problem”. During the developmental process, we need to be adept in perceiving issues concerning the overall situation from small things. With prudence and perseverance as our guide, the possibilities for future progress are great.

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