Do proton pump inhibitors harm to semen? Hyderabad Sindh based study

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Introduction

Enormous data is supporting proton pump inhibitors (PPI) are the best option for treatment of peptic ulcer disease, non-ulcer dyspepsia and erosive esophageal diseases. Omeprazole marketed first, was high selling drug over counter for one decade. Then many different molecules having strong potency and less side effects marketed over next 20 years and Dexlansprazole launched recently, claimed superior to other PPIs.

Regarding PPI, inhibitor of H+/K+ ATPase enzyme in gastric mucosal parietal cells, which are responsible acid production, so reducing total burden of acid over gastric mucosa [1].

Due to relieving effects of PPI, its easily misused as over the counter drug everywhere in world. In Pakistan its reported that more than fifty percent of patients on Proton pump inhibitors were without a definite indication [2]. Other study demonstrated >40% of discharged cards prescribed PPI with many antibiotics without any indication [3].

The association of PPI to male fertility is debatable. Many studies have shown concern over use of PPI in fertile male due to impaired absorption, achlorhydria and false facts.

Regarding infertility is divided into: primary infertility, secondary infertility and lifetime infertility.

The primary infertility is no conception after one year of unprotected intercourse. Secondary infertility is the inability to become pregnant after first conception and permanent infertility is unable to become pregnant with a live birth within five years of unprotected intercourse without any contraceptives [4].

Infertility is not uncommon, it affects more than 60 million couples all over world and problem is increasing [5]. Infertility is a common problem in Pakistan affecting about 21.9% in total, with 3.5% primary and 18.5% secondary infertility [6].

Among couples, males are responsible for 20 to 25% for infertility [7]. The common contributory factors could be some environmental factors like smoking, pollution, medical conditions like diabetes, any cancer treatment, mumps in past, genital surgery and multiple sexually transmitted diseases,
The PPI impairs sperm DNA synthesis is unclear. One explanation was impaired pH due to PPI use led to vitamin B12 deficiency which could inhibit DNA maturation and hence reduced sperm production [9].

In 2012, a study suggested that treatment using a PPI regimen, improves sperm motility in semen of infertile men [10] In contrast a small study showed abstinence from PPI is required for male partners who need a baby.

One researcher [11], suggested that use of PPI is not harmful to sperm directly and not acute one. It will reduce sperm quantity after 3 months or more and could be due to reduced semen B12 levels.

Garem et al [12], investigated thousands of semen for H.Pylori antibodies. He and colleagues suggested that treatment with PPI is beneficial for males who are planning for kid.

Many drugs used by males can be contributory for derangements of semen parameters A study showed that 26.65% infertile men have been unidentified multivitamins while herbal medicine users were 12.61% and over counter medicine users were 10.03%. Mixed types of medicines user reported in 4.49% [13]. This clearly shown that many drugs have toxic effects over sperms.

The rationale of this study to evaluate adverse effects of PPI on semen parameter of semen of healthy and young males of Hyderabad.

Methodology

109 healthy sexually active males were included which were on the PPI for at least 3 weeks before semen collection. The age was 19 to 45 years .The study as cross sectional observational. The pateints were not to advised for stopping PPI because of certain indications and unillingness to stop.

The procedure of semen analysis was explained and collected by masturbation in bottle provided by laboratory after written consent.

At least 2 ml of semen was collected after abstinence from coitus or masturbation for 7 days. Sample send to different laboratories of saddar to reduce the bias.

Following parameters were calculated

- Sperm count: > 15 million sperm per milliliter is considered normal, can be measured within 60 minutes of collection [14].
- Total sperm motility: Grade a – d. These are the strongest, weakest, non-motile or sluggish in semen.
- Sperm morphology: > 4% will have normal morphology.
- Semen volumes: 2-4 ml is normal.
- Normal pH: 7.1-8.0.

Liquefaction of semen, within 60 minutes is normal.

Total motile spermatozoa.

Total motile sperm count (TMSC) is a combination of sperm count, motility and volume.

In our study we have considered normal when 20 million sperm/ml, motility grade c or d and 75% of sperm cells alive.

TMSC. \( \geq 20 \times 10^6 \) was considered normal.

Two samples of semen were collected one before study and second after 6 months of PPI therapy. Confidentiality and secrecy was maintained by assigning number to subjects rather names.

Data are presented as mean ± standard deviation, median and percentages as appropriate. Linear regression used for age were used to test the on semen parameters pre and post PPI. Effect estimates and their 95% confidence intervals (CIs) are reported, and significance was assessed at the 0.05 level. Student unpaired t test used for p value.

Inclusion criteria was male 19-45 years and taking PPI in therapeutic doses at least 3 eeks before study. The dose of PPI for esomeprazole 40mg/day, rabeprazole 20mg/day and patoprazole 40mg /day.

Exclusion criteria included Age <18 years or >45 years, Azoosperma, consumption of any known spermatotoxic medication during the 3-month period before semen collection i.e medications included: testosterone, 5-alpha-reductase inhibitors, alpha-blockers, anticancer medications, anti-hypertensive medications, anti-depressants and psychoactive medication.

Results

General characteristics of the 109 subjects include median age as 24±7. 6, mean duration of PPI use was 2.5±2.7months. Only 34% were addicted except alcohol and sex practice including coitus and masturbation was observed in 55%, other parameters are shown in table 1.

No significant differences were observed in the general characteristics.

The sperm volume, ejaculate volume, total sperm count, sperm motility, normal head morphology and TMSC was observed (no p value was significant) table 2.

The use of PPI was although not statistically significantly associated with any other parameter except small decreased observed in semen volume of 1 ml /ejaculate p <0.05, table 2.

Discussion

This is an exceptional study done by us over healthy young males assessing the effects of PPI use on semen parameters. In our study 55% were married an doing coitus at least once a week, 45% were unmarried. 40% subjects were smoker and average BMI was 24±4.3.
Our results suggest that using a PPI is not connected with bad effects on semen parameters. Our findings are comparable with animal studies suggesting that PPIs not having sperm damaging effect [15].

Previous studies done showed that H. pylori infection of semen is more common in infertile men is associated with reduced sperm quality [16].

In contrast to these findings, one research [17] highlighted that PPI use can badly affect semen quality by decreasing the total motile sperm count, he had chosen dutch population who were planning for pregnancy taking PPI since decreasing the total motile sperm count, he had chosen dutch highlighting that PPI use can badly affect semen quality by comparing the semen parameter to control. No significant difference was found in semen parameters between cases and controls [18]. Which is matched to our study in which only difference was found in semen parameters between cases and controls [18]. Which is matched to our study in which only difference was found in semen parameters between cases and controls [18]. Which is matched to our study in which only difference was found in semen parameters between cases and controls [18]. Which is matched to our study in which only difference was found in semen parameters between cases and controls [18]. Which is matched to our study in which only difference was found in semen parameters between cases and controls [18]. Which is matched to our study in which only difference was found in semen parameters between cases and controls [18]. Which is matched to our study in which only difference was found in semen parameters between cases and controls [18]. Which is matched to our study in which only difference was found in semen parameters between cases and controls [18]. Which is matched to our study in which only difference was found in semen parameters between cases and controls [18]. Which is matched to our study in which only difference was found in semen parameters between cases and controls [18]. Which is matched to our study in which only difference was found in semen parameters between cases and controls [18].

Our findings were not matchable to above mentioned study dutch men that we have not seen any reduction semen parameter except volume of semen.

In another study, the investigators included 40 sub fertile men taking medication for gastric acid related symptoms and compared the semen parameter to control. No significant difference was found in semen parameters between cases and controls [18]. Which is matched to our study in which only semen volume significantly decreased p 0.05.

Proton pump inhibitors use with other non spermatotoxic drugs was not connected with harmful effects on five parameters of semen on sub fertile patients. Sperm harmful effects have not been reported from any animal or human study by PPI and declared safe [19].

A pilot survey of short duration [20], supported these findings by showing that proton pump inhibitors at hyper therapeutic dose for 1 week, did not cause any significant cause any low level of testosterone, follicle-stimulating hormone, Luteinising hormone and prolactin, which are essential for spermatogenesis.

The role of BMI, Smoking and sex practice was not found in literature with connection of PPI use. However many studies done over a single variable like Smoking but not related to PPI and semen analysis.

PPI use is a not associated it sperm toxicity it’s due to underlying other comorbidites which impairs quality of semen [21].

Conclusion

Proton pump inhibitors are quite safe in young males and do not cause semen abnormalities or sperm abnormalities.

References

improves sperm motility in infertile asthenozoospermic men. Urology 84: 1347-1350. Link: https://goo.gl/xXtBKN


