Evaluation of Trigonella Foenum Graecum L. (Fenugreek) Seeds Efficiency in Enhancing Male Reproductive Health

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Abstract

Over the years, research on Fenugreek evidenced that it had enormous beneficial effects on general health. This mini review focused on the research question of: "Is Fenugreek seeds cause increase of fertility or cause infertility problems? Although there is a growing body of literature relating to the effect of Fenugreek seeds on fertility and increase the reproductive performance, in the other hand, a contradictory literature on the negative effect of Fenugreek seeds on male reproductive health. In 2002, Fenugreek seeds have been used for the 1st time to treat male infertility. However, in 2006, the first study that talks about the anti-fertility of fenugreek was published. In this work we review the current evidence on the association between Fenugreek seeds and male reproductive health positive and negative effects.

Keywords: Trigonella foenum-graecum; Fenugreek; male reproductive health; infertility.

Introduction

The marker for exposure to potential reproductive toxicants and a diagnostic tool for male infertility which is the poorest semen quality semen parameters (sperm morphology, concentration, motility and total number of sperm [1], sperm DNA integrity and fragmentation [2].

Trigonella foenum-graecum Linn (Family: Fabaceae), also known as fenugreek, is an aromatic annual plant, 30–60 cm tall [3]. Fenugreek grows widely in Egypt, India, China, France, Spain, Morocco, Argentina, Iran and Turkey [4,5]. Its seeds contains the diosgenin [6] which is an important precursor for the synthesis of a number of sex hormones, including testosterone and estrogens [7]. It also contain three minor steroid saponins (similagenin, sasvagogenin and yuccagen-in), choline, trimethylamine (a sex hormone in frogs), vitamins (A, B2, B6, B12, D), lysine and l-tryptophan rich proteins, mucilaginous fibre, coumarin, fenugreekine, nicotinic acid, sapogenins, phytic acid, scopletin and trigonelline [8], calcium, iron, ß-carotene and other vitamins and essential oils [9]. Fenugreek seeds used as a flavoring agent and spicy added to foods [10]. Traditionally, fenugreek seeds is given to lactating females as a stimulant for milk production [11] and decrease Systemic symptoms of dysmenorrhea [12].

No studies confirmed if fenugreek seeds caused fertility or anti-fertility to female. Some studies on fenugreek seeds has shown it as anti-implantation and antifertility effects and may has abortifacient activity in rats [13]. While, [14] found histologically in female mice fenugreek seeds stopped folliculogenesis trend and destroyed ovary tissue [15] observed a teratogenic effect of fenugreek seeds in the female rabbits by significant decrease in number of newborn fetuses and increased plasma progesterone concentrations at 10 and 20 days of gestation without any change on prebreeding estrogen concentrations even the enhancement of fenugreek the ovulation before the abnormal fetuses development. These teratogenic effects may be due to the fact that of fenugreek seeds containing an estrogenic activity that bothers the uterine endometrial lining and interferes with the development of fetuses [16-19] showed that fenugreek may affect the mice central nervous system resulted from the sensorimotor impairment in neonates and adult mice found. On the other hand, [20] results revealed that fenugreek has no effect on female rat fertility by not altering the estrous cycle and the absent of abortifacient activity. In this work we review the current evidence on the association between Fenugreek seeds and male reproductive health positive and negative effects.

Fenugreek improves male fertility

There are many studies discussed the protective role of fenugreek against testes toxicity resulted from its constituent that have antioxidant and anti-inflammatory effect [21-27] as well as having a protective role against testes toxicity induced resulted from diabetes [28] found that Trigonella foenum graecum seeds increased the physiological aspects of libido in healthy adult males, but not affect the testosterone and prolactin level and explained that increase in the libido behavior due the present of sa-ponin which control the body physiological condition (blood sugar and the lipid profile laboratory test) [29,30] found crude Fenugreek seeds Oil had positive significant effect on the spermatogenesis of eighty patients, aging from 20-30 years, complaining of infertility due to oigospermia for 4-8 years and had been exclusion of any medical disease or surgical problems. Moreover [31] conducted a study in 120 men (age: 43-70 years; 600 mg day fenugreek extract/ 12 weeks) and found that fenugreek extract significantly increased free and total testosterone levels and sexual Function. Similarly [32] showed that extract from Fenugreek seed showed an enhanced fertility and improved sperm profile in most male Volunteers through raising testosterone level.

Fenugreek Anti-fertility effects

There are many studies in the antifertility and antiandrogenic activities of fenugreek to male sex [33] found significantly declined cholesterol level, sperm count, caudal spermatozoa motility, testes...
weights and androgen dependent parameters (protein, sialic acid and fructose) when male albino rats were fed with fenugreek seed extract (100 mg/day/rat) orally to rats for 60 days and their result of antifertility and antiandro-genic activities depend on the decrease of cholesterol which is the main precursor of the sex hormone [34] found that feeding diets contain ing 30% fenugreek seeds to male white New Zealand rabbits reduced testis weight, with damage to the seminiferous tubules and interstitial testis tissue sections followed by decrease of the androgen hormone and sperm concentrations. [35] found that 90 days treatment fenu-greek with 153, 305 and 610 mg/kg/day by oral gavage to male mice caused significant changes in the sperm percent motility and count, increase in spermatozoon morphology and chromosomal aberrations. Moreover [36] suggested that fenugreek tends to decrease male mice fertility by reducing the concentration of testosterone and sperms and inhibiting sperms mass and individual motility.

Fenugreek contains phytoestrogen compounds [37] and rich in steroidal saponins [38] that has an oestrogenic activity bind to the oestro- gen receptors and induce the expression of oestrogen responsive genes. The infertility effect of Fenugreek may be due to the phytoestrogen compound activity. Long-term exposure or high dose exposure to phytoestrogens affected male reproductive function by decreasing sperm count [39] and increasing developing germ cells apoptosis [40].

Figure 1: From the result, the summary of the fenugreek mecha-nism to male fertility and antifertility represented in diagram

Conclusion
Fenugreek seeds are rich with different benefits and medical com-pounds that has antioxidant and anti-inflammatory activity. Antifertil-ity of fenugreek may be resulted from its richness of phytoestrogen compounds. Fenugreek seeds not recommended to be used to increase the male fertility, and if will be used in other studies (antioxidant, anti-inflamma-tory, anticancer activity) should be used in low doses for a short time as using low doses of phytoestrogen neither affects the semen quality nor the reproductive function. Further studies are needed to answer the question: Can fenugreek be an endocrine distributor like other phytoestrogen compound? And to study and confirm the exact fenugreek mechanism of actions to improve fertility or induce infertility as it is poorly studied.

References


