



Evaluation of Spermatogenic Action in the Management of Oligospermia

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Abstract: Infertility is the major reproductive health problem in today's era. About 15% of couples have infertility problems which 40% are related to the male factors. The oligozoospermia is a condition related to infertility which is associated with low sperm concentration. An objective of this study was to observe the effect of ayurvedic medicine on infertile men and to observe changes in sperm concentration, sperm motility and sperm morphology in the subjects before and after treatment. The interinstitutional study was conducted in the Physiology department, J N Medical College and Panchakarma at Wardha. Patients were also referred from department obstetrics and gynecology, Mahatma Gandhi Ayurved College Hospital and Research Center Salod. All the patients were informed regarding the procedure and the semen sample was collected. It was analyzed as per WHO guidelines. The patients having oligozoospermia were explained about the treatment pattern. They were called again for analysis of semen samples after 3 months and 6 months duration. Oligospermia is the condition in which sperm count <20 Millions/ml. On observation, the results in patients before the treatment showed very less count of the sperm concentration, abnormal morphology and reduced motility was found. After the 3 and 6 months of the treatment percentage of sperm concentration, sperm motility and increased sperm morphology. The treatment of the patients was given oral Ayurvedic medicine in improvement of above said parameters. The conclusion of this study was the Ayurvedic formulation can be used in oligozoospermia patients.

Keyword: Ayurvedic Medicine, Grade of motility, Male infertility, Sperm count, oligozoospermia.

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Received On 22 July 2020

Revised On 01 December 2020

Accepted On 10 December 2020

Published On 10 March 2021

Funding This research did not receive any specific grant from any funding agencies in the public, commercial or not for profit sectors.

Citation Milind Abhimanyu Nisargandha and Shweta Dadarao Parwe , Evaluation of Spermatogenic Action in the Management of Oligospermia.(2021).Int. J. Life Sci. Pharma Res.11(2), P218-223 <http://dx.doi.org/10.22376/ijpbs/lpr.2021.11.2.P218-223>

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1. INTRODUCTION

Male infertility is one of the major factors in infertile couple. Infertility affects 15% of couples in their reproductive life all over the world. The prevalence of infertility is increasing globally and male infertility is the most of prevalent which is around 40 %.¹ Male infertility is the multifactorial complication disorder since several decades. Very few studies on the male infertility have used diagnostic criteria.² Investigators endeavors to reveal the clinical management for molecular procedures, although the most aspects remain clinical obstacles.³ There are many causes for the male infertility like infection, trauma, cystic fibrosis, varicoceles etc but in the current scenario in Indian population their changes in lifestyle, nature of work and daily routine is the one of the major factors contributing to increase the infertility. Male reproductive function is highly sensitive for many factors such as physical and chemical agents which leads to infertility.⁴ Infertility is defined as the inability of sexually active, non-contraception couple to achieve pregnancy in one year.⁵ 40 to 50 % of cases semen analysis can rule out the cause of abnormality. It can easily determine total sperm count, motility, and morphology of the sperm. Many drugs in the market are available but it might become a side effect which may be ignored. The long-term diagnostic and treatment procedure may also show the negative impact on the sexual life of the infertile couple.⁶ Therefore, in Ayurveda, there are many drugs which yet to check their efficacy and use for threatening such infertile patients. Hence, set the objective for observing the effect of ayurvedic medicine on infertile men and to observe the changes in percentage of sperm concentration, sperm motility and sperm morphology before and after the treatment. In the male infertility decreased sperm production is a factor that causes infertility. Sperm count is less than or equal to 20 million sperm per ml of semen called oligozoospermia. Male infertility is due to abnormal sperm count.^{7,8} Many studies carried out in Indian population were semen parameters deteriorate in males, these studies provide shows that the quality of semen was affected due to some factors like nutrition, environment and life style modification.^{9,10} Many people seen that their reduced sperm concentration motility and morphology during semen analysis.¹¹ In this condition the family of infertile couple are gone through the stressful condition, as there are very cost and complexity in which they cannot found the solution of this problem of infertility. The preparation of Ayurvedic medicine for not only cost effective but it will be improving the sperm production.

Lifestyle modification and interventions of Ayurvedic preparation may be the best management to improve the sperm count in infertile male. Hence, we undertook this study, for their scientific confirmation in male infertility. The present study was designed to evaluate the effect of Ayurvedic preparation on the male infertility to observe their scientific approach.

2. METHODS AND MATERIALS

The interinstitutional work was conducted at the department of physiology JN Jawaharlal Nehru Medical College Wardha and department of Panchakarma, Wardha. The patients came from the Obstetrics and Gynecology department and Panchkarma to the physiology Laboratory for semen analysis. The patients were selected according to their history and collection of semen was done as per WHO guidelines.

2.1 Inclusion Criteria

Age group between 22 to 50 years, Infertile male Sperm count <20 million /ml.

2.2 Exclusion Criteria

Age below 22 and above 50 years, Sperm count >20 million/ml, Patients with disease like Diabetic mellitus (DM), Varicocele, assersary sex gland infection and Sexually transmitted disease (STD), Patients with azoospermia and aspermia.

2.3 Collection of Semen sample

The proper instruction was given to the patients regarding the absentees of intercourse four days before performing semen analysis. These patients were provided pre labelled, clean, dry 50 ml beakers and advised them to collect all the amount of ejaculated semen samples in it. These samples were kept for 20 minutes for liquification and then observed under a microscope.

2.4 Procurement of test drug

The good quality of drugs was prepared at *Dattatray Rasahala* Pharmacy attached to the MGACH & RC. The power form medicine was made into suspension with 5 ml honey and 10 ml Goghurut (Ghee).

Table 1: Contents of Ayurvedic Formulation for Oligospermia

| S.no | Grugs | Latin name | Dose |
|------|----------------------|----------------------|-------|
| 1 | Guduchi Powder | Tinospora Cordifolia | 1 gm |
| 2 | Amalaki Powder | Phallanthus emblica | 1 gm |
| 3 | Gokshur powder | Tribulus Terrestris | 1 gm |
| 4 | Along with Honey and | | 5 ml |
| 5 | Goghurut | | 10 ml |

The infertile men were informed about the dose and treatment pattern and the schedule of semen analysis was fixed after 3 and 6 months respectively. Along with medication advised them for regular physical exercise (*Asana* and *Pranayama*), meditation and modification in lifestyle.

Sample size - 60 patients

Study type - longitudinal.

Study design - Pre-Post design

Study period - Three year

Study Area - Department of Physiology JNMC Wardha & Panchakarma, Wardha

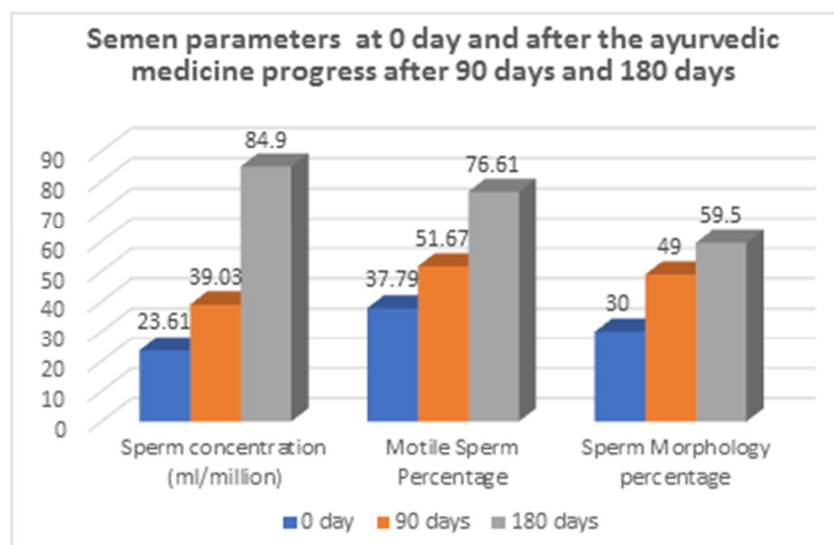
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3. RESULT

In this study, we observed that the percentage of sperm

concentration, motile sperm and sperm morphology was very poor in the patients when their semen analysis was performed in the laboratory. Once they were confirmed cases of oligozoospermia, then the treatment was started. These patients had given Ayurvedic medication in proper doses as mentioned above. After given a proper medication for three months then patients went through semen analysis after 90 days. These patients were called third time for

analysis after the 180 days to find the effect of medicine, it shows improvement in the all above mentioned parameters. In graph 1 show that the percentage of sperm concentration, motile sperm and sperm morphology was very less in the male before the treatment. After given medication for 3 months (90 days) and 6 months (180 days), it is observed that improvement in the patients of oligozoospermia.



Graph 1: Percentage of sperm concentration, motile sperm and sperm morphology before treatment and after treatment of 90 days and 180 days.

In this Fig 1 observed that, sperm count was very less and its sperm motility and morphology was not normal in the male at zero day. Semen analysis was carried out in the reproduction laboratory. In these patients, it is clearly observed that the subjects were diagnosed as oligozoospermia, Fig 2 shows that patients have improved

the sperm concentration, motility and morphology due to Ayurvedic preparation after 90 days, and Fig 3 shows that the significant improvement was observed in the patients after 180 days. Ayurvedic preparation was given to the patients to continue for 6 months, improvement was observed in sperm parameters. It was depicted in Fig 3.

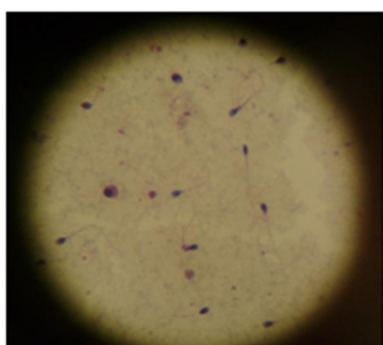


Fig 1: Sperm count in infertile subjects before the treatment.

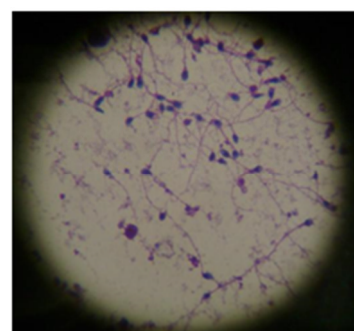


Fig 2: Improvement in the sperm count after three months treatment.

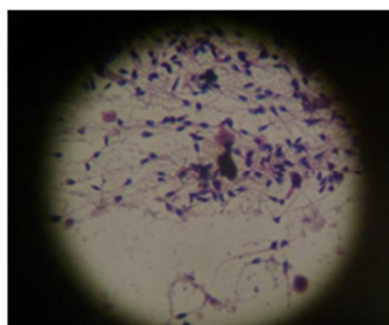


Fig 3: Improvement in the sperm count after six months of treatment.

4. DISCUSSION

The antioxidant becomes more popular in the management of male infertility. Presence of excessive oxidative stress may lead to male infertility. The sperm are made up from unsaturated fatty acid, which is sensitive for free radical damage by lipid peroxidation. Physiological and environmental factors may cause of poor sperm quality. Therefore, the ayurvedic medication as part of line of treatment is used as antioxidants in infertile male. The Percentages of sperm concentration is the important parameter in the male infertility. Less than 20 million per ml is considered oligozoospermia. In this study, - Graph 1 shows the mean percentage of sperm concentration was 23.61million per ml which was lower in ranges at 0 days which was improved up to 84.90 million per ml. Decreased motility is a cause of change in the spermatogenesis, it may result in release of abnormal or immature sperms. In our study, it also shows the very less motile sperm and abnormal morphology. The lifestyle related changes may cause the poor semen quality. Obesity, addiction of alcohol, extreme sport (marathon training) and increase in the scrotal temperature due to thermal underwear, sauna or hot tube use or occupational exposure to heat source, this may lead to the affect the spermatogenesis.¹²

4.1 Guduchi (*Tinospora cordifolia*)

Powder supplementation on sexual behavior, semen production and testosterone level of Muzzafar nagari rams.^{13,14,15} *Guduchi* is considered best *Rasayana* (Rejuvenation therapy) which is immune modulator activity, *Balya* (Strength) and *Rasayana* properties of the plant.¹⁶ "Methanolic extract of *T. cordifolia* has been reported against microbial infection, Antibacterial activity."¹⁷ *Guduchi* have impact on both the sexual excitement and sexual execution of the natural frameworks and these medications have stimulatory impact on the copulatory conduct.¹⁸ *Guduchi* has a noteworthy job in the guideline of glucose digestion. It is proposed that by ideals of these fixings, it controls the declaration of GLUT-5 in sperm cells, in this way appropriately regulating their motility.¹⁹ Oral organization of 70% methanolic concentrate of *Tinospora cordifolia* stem decreases sperm motility and thickness, bringing down of serum testosterone, protein, sialic corrosive, glycogen substance, and exhaustion of vesicular fructose of testicles prompting decrease of male richness in rodents.²⁰

4.2 Amlaki (*Embolica Officinalis*)

Seminal plasma found maximum vitamin C due to decreased level of this vitamin there may be sperm abnormality. *Amlaki* (*Embolica Officinalis*) powder contains high concentration of vitamin C which helps to increase the concentration of seminal plasma. It is one most important factor in various amidation processes and hydroxylation. It also prevents lipid peroxidation and it may improve the antioxidant in the body which helps to improve the semen count and motility. The *Amalaki* is given to address disability in spermatogenesis *shukra shodhana* (Purification of semen) activity. Along these lines there may be creation of sound sperm both morphologically and motility wise.²¹ Similar finding was observed in Gerco et al on infertile male. They treated by 1 gm of vitamin C and E intervention was given, in his study after intervention of two months, level of DNA damage was reduced.²² In his other study, "They stated that two months

of treatment with 1gm vitamin E and C improve ICSI success rate in the patients with sperm DNA damage. DNA damage level was reduced."²³

4.3 Gokshur (*Tribulus terrestris*)

The free radical like Nitric Oxide is one of the biochemical markers which discharge from the axons of parasympathetic nerve on sexual incitement, keeping the Spanish fly movement. "The Nitric Oxide diffuses in to smooth muscle that lines those corridors of corpus cavernosum (erectile tissues) and initiates the catalyst Guanylate cyclase. This later believers Nucleotide Guanosine triphosphate in to cyclic Guanosine monophosphate (cGMP)". The cGMP causes to penis smooth muscle to unwind, prompting winding and expanded transition of blood in to penile tissue. This blood is basically the cause for erection of penis. Love potion possibilities restrain the breakdown activity of PDE-5 with the outcome that dynamic cGMP can collect. The audit uncovers that Ayurvedic therapeutic plants, for example, *Tribulus terrestris* are basic models that demonstration by methods for the above system.²⁴ Singh et al. assessed the intense and rehashed portion organization of lyophilized watery concentrate of the dried products of *Tribulus terrestris* (TT) (LAET) at dosages of 50 and 100 mg/kg of body weight as a sexual enhancer in the administration of sexual brokenness in male rodent. "A portion of subordinate improvement in sexual conduct was seen with the LAET treatment, which was increasingly unmistakable on interminable organization of LAET. A noteworthy increment in serum testosterone levels excessively was watched. These discoveries affirm the conventional utilization of TT as a sexual enhancer in the administration of sexual brokenness in guys."²⁵ *Tribulus terrestris* (TT) prompts an ascent in the creation of luteinizing hormones. While luteinizing hormone levels are expanded, the regular creation of testosterone additionally increments. The saponin in TT thought to be answerable for its impact on testosterone levels and on libido. This medication may have expanded the testosterone level and there by the creation of sperms expanded. *T. terrestris* is seen as compelling for men with Anti-sperm antibodies. This activity may have assisted the patients with hostile to sperm antibodies, with recovering from it.²⁶ The *tribulus terrestris* containg protodioscine (PTN) as an Aphrodisiac.

4.4 Honey

Honey acts as a healing process properly due to its catalase enzymes. Another important action of Honey is bactericidal, antiseptic, sedative and mild laxative. It is also act as a highly viscous barrier preventing bacterial penetration and colonization. It is easily absorbed into the blood stream so works fast.²⁷

4.5 Goghrut

It has cooling as well as rejuvenating properties, it also bestows luster and beauty, enhance stamina and promotes longevity. It is as an aphrodisiac and protects the body from various diseases.²⁸ The ingredients of ayurvedic medicine used in this study act as immunomodulatory, antioxidant mechanisms which maintain the sperm motility and spermatogenesis. The sperm are able to fertilize the ovum.

5. CONCLUSION

There were many factors affected by infertility in male, but if they regularly perform proper physical exercises, diet and meditation along with ayurvedic medicine which can be helpful for improving the quality and count of sperm. We conclude that the ayurvedic preparation was used here to improve the quality and quantity of sperm. We found the best result in sperm parameters.

6. AUTHORS CONTRIBUTION STATEMENT

Dr. Milind N conceptualized and gathered the data with regard to this work. Dr. Shweta P and Dr. Milind N analyzed these data and necessary inputs were given towards the

designing of the manuscript. Both the authors discussed the methodology and result and contributed to the final manuscript.

7. ACKNOWLEDGEMENT

We specially thanks Dr. Deepti Shrivastava Professor Obstetrics and Gynecology JN Medical College and Panchakarma MGACH&RC for sending male patients for semen analysis.

8. CONFLICT OF INTEREST

Conflict interest declared none.

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