Treatment Outcome of Oligospermia by HCG

Nusrat Hossain[1], Kamrun Nahaer[2], Safura Khatun[3], Sabiha Najneen[4], AKM Alamgir Hossain[5], Al Fatah Al Adiluzzaman[6]

1. Junior Consultant
   Department of Gynae & Obs.
   UHC, Pirgacha, Rangpur
2. Professor
   Department of Gynae & Obs,
   Rangpur Medical College
3. Assistant Professor
   Department of Medicine of Gynae & Obs.
   Rangpur Medical College (RpMC)
4. Senior Consultant
   Department of Gynae & Obs,
   Rangpur Medical College Hospital
5. Preventive Medicine Specialist
   10 Fd Amb
6. Assistant Professor
   Department of Medicine
   Rangpur Medical College Hospital

Correspondence to:
Nusrat Hossain
Junior Consultant
Department of Gynae & Obs.
UHC, Pirgacha, Rangpur

Abstract:

Background:
In men, human chorionic gonadotropin (HCG) injection can be applied not only to the hypogonadotropic hypogonadism, but also to the oligospermia with nomal gonadotrophin level. Objective: The objective of this was to evaluate the effect of HCG therapy on semen parameters in normogonadotropic men suffering from oligospermia.

Methods:
It is a descriptive type of cross sectional study. Done in a government registered private laboratory – LAB A ONE INFERTILITY CENTRE; Rangpur Bangladesh, Over a period of 5 years from January 2016 to December 2020. Total 600 patients were taken randomly having sperm count around 1 lac /ml semen. Prestructured questionnaire was filled after proper counseling. Local ethical committee clearance was taken. Data was analysed by SPss version 23 and ploted as frequency percent.

Result:
Total 75% patients belonged to age group between 20 – 30 years. 66% patients got Letrogol on the basis of s. oestradoil. 45. 16% patients improved semen count about 5 fold within 21 days treatment with inj: HCG 5000 IU intramuscular twice weekly.

Conclusion:
Total sperm output increased by on average of semen concentration, the percentage of motile sperm, and the proportions of normally formed spermatozoa. So by observation of study that this type of treatment may be a blessing for oligospermic patient in low economic resort of so far IVF.

Key words: Oligospermia, HCG

Introduction:

Oligospermia is a male fertility issue characterized by a low sperm count. Other aspects of the sexual health of men with this condition are typical. This includes the ability to get and maintain an erection, as well as produce ejaculation at orgasm. Sperm count in male ejaculate can vary throughout their life. A healthy sperm amount is often necessary for fertility. The World Health Organization (WHO) classifies sperm counts at or above 15 million sperm per millilitre (ml)of semen as average.[1] Anything below that is considered low and is diagnosed as oligospermia. Mild oligospermia is 10 to 15 million sperm/mL. Moderate oligospermia is considered 5 to 10 million sperm/mL. Severe oligospermia is diagnosed when sperm counts fall between 0 and 5 million sperm/mL.It's unclear how many men have low sperm counts in their semen. This is, in part, because not everyone with the condition is diagnosed. Only men who have difficulty with conceiving naturally and ultimately seek help may be diagnosed.[2]

Various treatments are available for the infertile couple, ranging from optimizing the current semen parameters with medical therapy to minor surgical procedures and finally to complex sperm retrieval like ART. Technological advancements in assisted reproduction make conceiving a child possible with viable sperm and egg. While the workup has traditionally been delayed until a couple has been unable to conceive for 12 months, beginning the workup at the first visit is nowrecommended.[3] The pituitary gland, which lies on a stalk beneath the hypothalamus in the sellaturcica, contains the gonadotrop-

ic cells that produce both FSH and LH. These are glycopeptides with a molecular weight of 10,000 daltons. They are made up of an alpha chain that is identical with that of hCG and Thyroid Stimulating Hormone (TSH) and a beta chain that is unique for each. FSH has a lower plasma con-centration and longer half-life than LH, and it has less obvious pulsatile changes.[4] The pulsatile nature of Gonadotropin Releasing Hormone (GnRH) is essential for normal gonadotropin release; a continuous stimulation inhibits their secretion.[5] After release into the systemic circulation, FSH and LH exert their effect by binding to plasma membrane receptors of the target cells. LH mainly functions to stimulate testosterone secretion from the Leydig cells of the testicle, while FSH stimulates Sertoli cells to facilitate germ cell differentiation.[6] Gonadotropin release is modulated by a variety of other signals, such as estradiol(a potent inhibitor of both LH and FSH release),and inhibin from the Sertoli cell, which causes a selective decrease in FSH release.[5] Decrease amount of LH production fail to initiate spermatogenesis thus causing oligospermia due to secondary deficiency of testosterone.[7] Use of hCG in such patient have become routine however in male endogenous production of hCG does not occur and is thus substituted from outside. Purified hCG is an effective substitute for LH since the structural homology between these two hormones which act through the same Leydig cell receptor.[8]

Materials and Methods:

It was a descriptive type of cross sectional study done in government registered private laboratory LAB A ONE INFERTILITY CENTRE, Rangpur, Bangladesh, over a period of 5 years from January 2016 to December 2020.Total 600 patients were taken randomly having sperm count ≥1 lac/ml semen and teratozoospermia and asthenospermia was excluded from the study. Female partners did not have any cause of subfertility. Before doing the study written consent of the patient was taken after proper explanation. Then prestructured questionnaire was filled after proper counseling. Local Ethical Committee clearance was taken. Their hormone profile S. Testosteron, S. Estradiol, S.Prolactin were done to identify the cause. Other tests like RBS, USG OF Seminal vescicle, testis were done to see associated causes Then treatment was started with Inj.HCG 5000IU intramuscular twice weekly. Either clomiphene citrate 150 mg or Letrozole 5mg was given to the patients depending on S. estradiol level. Next semen analysis was done after 21 days. Treatment continued in this manner at least 3 months. Most of the patients reached normal level within 3 months treatment. Data was analyzed by SPSS version23 and plotted as frequency percent.

Results:

The results of the study was plotted in tables as frequency percentage.

Table-I: Age of the patients (n-600)

Age in years	No of patients	Percentage
20-30	450	75%
30-40	90	15%
40-50	60	10%

TOTAL 75% patients belonged to age group between 20-30 years.

Table-II: Socioeconomic status of patients (n-600)

Income in taka	No of patients	Percentage
<30000	22	3.6%
30000-60000	402	67%
>60000	176	29.33%

67% PATIENTS were from middle income group taka 30000-60000. (according to Asian Development Bank,4 oct,2020)

Table-III: H/O smoking (n-600)

H/O smoking	No of patients	Percentage
Smoker	447	74.5%
Non Smoker	153	25.5%

Total 75.5% patients were smoker

Table-IV: USE of Clomiphene citrate /letrozole along with inj.HCG (n-600)

Drug	No of patients	Percentage
Clomiphene	150	25%
Letrozole	396	66%
None	54	9%

66% patients got Letrozole on the basis of S. estradiol.

Table-V: Sperm count statusafter 21 days treatment with inj. HCG (n-600)

No of patients	Initial sperm count /ml	21 days after inj. HCG spermcount/ ml	percentage
271	1 lac	5 lac	45.16%
209	1 lac	1 million	34.83%
120	1lac	10 million	20%

45.16% patients improved sperm count about 5 fold within 21 days treatment with Inj.HCG.

Discussion:

The primary function of hCG is to increase the synthesis of testosterone[6]. As a result of increase Testosterone sperm concentration was increased in 45.16% patient that was 5 fold increase in 21 days treatment to 45 million/ml after 90 days treatment in our study. Thus the primary efficacy and end point was sperm density and semen volume after hCG treatment. These results coincides with Higashi who in 1998 studied 28 men with primary, complete isolated hypogonadotropic hypogonadism and administered hCG for 3-6 months followed by semen analysis and pregnancy in the female partner for couple who desired fertility.[9] Problem remains with the diagnosis of infertility where hormone level plays variable role in its diagnosis. Disturbance of hormone level absolutely requires their substitution in combination or alone. Thus it is recommended that when labeling the male with infertility hormones level must be accessed beside sperm count.

Conclusion:

Our study was done in north part of Bangladesh, Rangpur.Most of the patients belonged to middle and lower middle income group. So the treatment I prescribed for the patients with inj.HCG ,CC/Letrozole were costly but patients could afford that. Lastly it is by observation of study that this type of treatment may be a blessing for oligospermic patient in low economic resort instead of so far IVF.

Recommendations:

1. Public awareness about male infertility. As male and female are more or less equally responsible for infertility. But female partner are blamed in most of the subfertility cases.
2. Hormone analysis must be accompanied with semen analysis when semen parameter shows oligospermia, asthenospermia.
3. Patients should come for follow up.

Limitations:

As people of rangpur division are not economically well off and highly educated, they are reluctant to investigate the male factors but we did that with appropriate councelling and motivation.

References:

1. Fertility 2013 (NICE guideline CG156) recommendation1.3.1.1.
2. Medically reviewed Daniel Murrell,M.D— Written by Kimberly Holland— Updated on September 29, 2018Oligospermia and Fertility: What You Should Know
3. Lunenfeld B, Olchovsky D, Tadir Y, Glezerman M. Treatment of male infertility with human gonadotrophins: selection of cases, management and results. Andrologia. 1979 Sep-Oct;11(5):331-6. doi: 10.1111/j. 1439-0272.1979.tb02216.x.
4. Adamopoulos DA, Nicopoulou S, Kapolla N, Vassilopoulos P, Karamertzanis M. Testicular secretion after pulsatile human menopausal gonadotropin therapy in gonadotropin-releasing hormone agonist desensitized dysspermic men. Fertil Steril. 1994 Jul;62(1):155-61. doi: 10.1016/s0015-0282(16)56832-0.
5. Glass AR, Vigersky RA. Leydig cell function in idiopathic oligospermia. Fertil Steril. 1980 Aug; 34(2):144-8.
6. McLachlan RI, Finkel DM, Bremner WJ, Snyder PJ. Serum inhibin concentrations before and during gonadotropin treatment in men with hypogonadotropic hypogonadism: physiological and clinical implications. J Clin Endocrinol Metab. 1990 May; 70(5):1414-9. doi: 10.1210/jcem-70-5-1414.
7. Shane JM. Evaluation and treatment of infertility. Clin Symp. 1993;45(2):2-32.
8. Masala A, Delitala G, Alagna S, DeVilla L, Rovasio PP, Borroni G. Effect of synthetic LH-RH and hCG administration on plasma testosterone, androstenedione, and estradiol 17beta levels in normal men and in patients with idiopathic oligospermia. Int J Fertil. 1979;24(1):71-3.
9. Efficacy and safety of highly purified urinary follicle-stimulating hormone with human chorionic gonadotropin for treating men with isolated hypogonadotropic hypogonadism. European Metrodin HP Study Group. Fertil Steril. 1998 Aug;70(2):256-62. doi: 10.1016/s0015-0282(98)00156-3.