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PREVALENCE AND CAUSES OF MALE INFERTILITY IN THE PLAINS OF SUB-HIMALAYAN REGION OF DARJEELING AND JALPAIGURI DISTRICT OF WEST BENGAL

Physiology

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ABSTRACT

BACKGROUND: Infertility, defined as the inability to conceive after 12 months of unprotected intercourse, affects 10–15 percent of all couples. Its incidence is gradually increasing. Multiples causes are involved in male partner for infertility.

OBJECTIVE: The aim of present study was to find out the prevalence of infertility due to male causes and to find out the different causes of male infertility.

RESULTS: Total 30 infertile male were included in the study. It was observed that 21 male subjects [n=21, 70%] out of 30 subjects with no spermatozoa in semen analysis. Hence these subjects were suffering from infertility from azoospermia and asthenospermia [n=2, 6%] and oligospermia [n=7, 23%]. Fourteen out of 30 subjects [n=14, 47%] were with increased TSH level (more than normal range i.e.> 5.70Miu/ml). Nine out of 30 subjects[n=9, 30%] with decreased serum Testosterone[2.6-10 ng/ml] and ten out of 30 subjects and twelve out of 30 subjects with increased serum LH and FSH respectively. Hence subjects of male infertility having relation with hormones findings..

CONCLUSION: It has been seen that among huge varieties of causes involved in male infertility, azoospermia and low testosterone hormones are main causative agents for male infertility.

KEYWORDS

infertility, incidence, testosterone, Azoospermia.

INTRODUCTION:

Infertility is a disease of reproductive system defined by failure to achieve the Clinical pregnancy after 12 months or more of regular unprotected sexual intercourse.[1]Infertility is a condition with psychological, economic, medical implications resulting in trauma, stress, particularly in a social set-up. The most studies which have attempted to evaluate the etiology of male infertility have used the conventional criteria, promulgated by the World Health Organization [1999], to define the male infertility [2] Male infertility refers to a male's inability to cause pregnancy in a fertile female. In Human, its accounts for 40% to 50% of infertility.[3] and It affects an approximately 7% of all men [4] In men who have the necessary reproductive organs to procreate, infertility can be caused by low sperm count due to endocrine problems, drugs, radiation, or infection.

MATERIALS AND METHODS

This was a cross sectional study. The study was carried out at the Dept. of physiology in collaboration with the Dept. of Obstetrics and Gynaecology of NBMCH, Sushrutanagar, Darjeeling, WB. From July 2012 to July 2014. The study was approved by the Institutional Human Research ethics committee. The study population included 30 male infertility patients diagnosed by a gynecologist. 30 healthy male individuals were taken as control group. A written informed consent was obtained from all the voluntary participants prior to their recruitment in the study.

Subject inclusion criteria

1. Healthy male partners of infertile couple
2. Age of subjects in study group within reproductive period
3. Willing persons in research process

Subject exclusion criteria

1. Female partners of infertile couple
2. Congenital and chromosomal abnormality of male partner
3. Castration of male genital organ
4. Male infertility associated with professional hazards and environmental factors

Study Parameters

- Diagnosis of male infertility begins with a medical history, physical examination.
- Biochemical tests: Laboratory investigations have done on Semen analysis, the blood measuring blood sugar both fasting and post prandial and serum T3, t4 and TSH, LH, FSH and Testosterone.

METHOD

- T3, T4 and TSH……..Immuno-Fluorescence Assay Technology, AIA-330 TOSOH
- LH, FSH and Testosterone. ……. Test Done by COBAS e411 Immuno Assay Analyzer
- Sperm Analysis was done

STATISTICAL ANALYSES AND RESULTS

Averages (Means) and standard deviations of the parameters for study and control groups have been calculated, presented by bar diagrams and tested for the existences of the differences of the parameters between study and control groups using Analysis of Variance (ANOVA) (one-way classified data) and corresponding test is F. Coefficients of correlation (Pearsonian) of parameters for study and control groups have been calculated and their significances have been tested using t test. Only significant coefficients of correlation have been presented here.

Dimension reduction: Factor Analysis technique has been employed to the parameters. Factor Analysis aims at grouping the original variables into a fewer factors (latent variables or constructs) which underlie the strongly related input variables IBM SPSS 21 and MS-Excel have been used for data analysis.

RESULT

Table-1 showing Means and Standard deviations (S.D.) of the parameters in cases of study and control groups along with p-values for significant differences

Paramemets	Study group		Control group		p-value
	Mean	S.D.	Mean	S.D.	
Age (yrs)	31.37	5.08	29.03	3.74	0.047 Significant
DM (yrs)	5.80	2.66	4.40	1.67	0.018 Significant
Blood sugar (Fasting) (mg/dl70-110]	92.10	8.47	89.87	13.10	0.438 Insignificant
Blood Sugar (PP) (mg/dl) [80-140]	122.63	18.24	111.67	7.44	0.003 Significant
LH (µIU/ml)[1.7-8.6]	14.26	11.44	5.88	1.80	<0.001 Significant

FSH (µIU/ml)[1.5-12.4]	24.10	16.05	11.55	3.99	<0.001 Significant
TESTOS (ng/ml) [2.6-10.0]	3.67	2.95	6.23	1.66	<0.001 Significant
T3 (ngm/ml[0.79-1.58]	1.24	0.31	1.04	0.18	0.003 Significant
T4 (µg/dl)[4.0-11.0]	7.40	2.20	7.91	1.60	0.306 Insignificant
TSH (µIU/ml)[.39-5.70]	2.65	1.40	3.31	1.15	0.049 Significant
SP. Count [15-213mill/ml]	5.93	9.13	100.67	14.63	<0.001 Significant

There are significant differences of averages of the parameters between two groups study and control except the parameters Blood Sugar (Fasting) and T4.

Fig-1

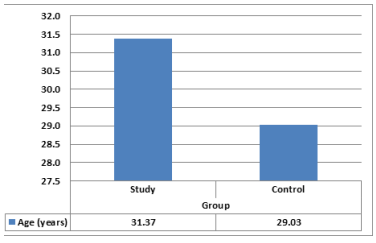


Fig-2

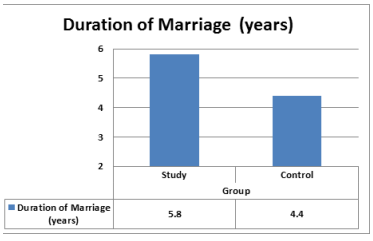
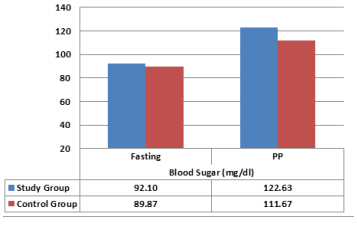


Fig-3



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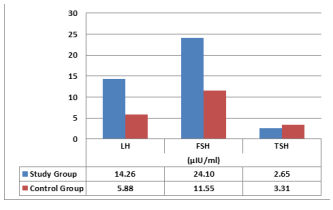

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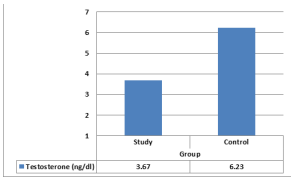


Fig-6

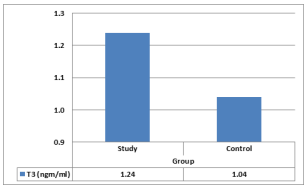


Fig-7

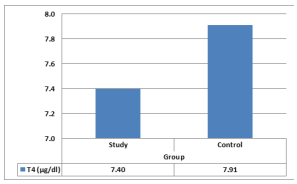
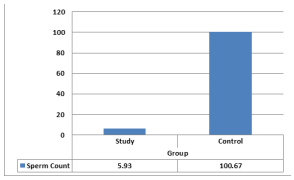


Fig-8



Correlation coefficients between the parameters in cases of the Study and Control groups have calculated and their significances have been tested using t test. Only significant correlation coefficients are present below. P-Values are given in brackets

In case of Study group

1. Age is significantly positively correlated with DM: Correlation coefficient 0.497 (0.005)
2. LH is significantly positively correlated with FSH: Correlation coefficient 0.758 (<0.001), significantly negatively correlated with Testosterone: Correlation coefficient -0.509 (0.004) and with Sperm Count: Correlation coefficient -0.518 (0.003)
3. FSH is significantly positively correlated with LH: Correlation coefficient 0.758 (<0.001), significantly negatively correlated with Testosterone: Correlation coefficient -0.605 (<0.001) and with Sperm Count: Correlation coefficient -0.456 (0.011)
4. Testosterone is significantly negatively correlated with LH: Correlation coefficient -0.509 (0.004), with FSH Correlation coefficient -0.605 (<0.001)
5. T3 is significantly positively correlated with TSH: Correlation coefficient 0.445 (0.014),
6. TSH is significantly positively correlated with T3: Correlation coefficient 0.445 (0.014),
7. Sperm count is significantly negatively correlated with LH : Correlation coefficient -0.518 (0.003), with FSH Correlation coefficient -0.456(0.011)

In case of Control group

1. Age is significantly positively correlated with DM : Correlation coefficient 0.560 (0.001)
2. DM is significantly positively correlated with Age : Correlation coefficient 0.560 (0.001)
3. Blood sugar fasting is significantly positively correlated with Blood Sugar PP : Correlation coefficient 0.735 (<0.001)
4. Blood sugar PP is significantly positively correlated with Blood Sugar Fasting: Correlation coefficient 0.735 (<0.001)
5. LH is significantly positively correlated with FSH : Correlation coefficient 0.501 (0.005),
6. FSH is significantly positively correlated with LH : Correlation coefficient 0.501 (0.005),

In case of control group, (a) parameters are least associated among themselves compared to study group, (b) parameter Sperm is not associated with others.

Factor analysis has been employed to the parameters of all cases of study and control groups. Results of Factor analysis has been given below.

Factor No.	Factor Name	Parameter	Average	S.D.	Loading	% of Variance explained
1	Hormone Study Factor	LH	10.07	9.15	0.891	26.971
		FSH	17.82	13.21	0.861	
		Testosterone	4.95	2.70	-0.754	
		Sp. Count	53.30	49.28	-0.681	
2	Age Factor	Age	30.20	4.57	0.877	14.878
		DM	5.10	2.31	0.849	
3	Blood Sugar Factor	Fast	90.98	11.00	0.761	14.717
		PP	117.15	14.87	0.860	

4	Thyroid Hormone Factor	T3	1.14	0.27	0.564	12.363
		T4	7.66	1.92	0.826	
		TSH	2.98	1.31	0.710	
% of Total variance explained by Factor Analysis : 68.928						
KMO Measure of Sampling Adequacy : 0.628 (Mediocre)						
Bartlet's Test of Sphericity, Approx. $\chi 2$: 210.335, Df: 55, p-value: <0.001						

DISCUSSION

Male infertility is a global population health concern. There are an estimated 48·5 million couples with infertility worldwide. The research study that we have conducted and design to determine the gradual increase the incidence of male infertility in the plain area of Darjeeling and Jalpaiguri District. It has been revealed in our study that Azoospermia, oligospermia and Asthenospermia are main causes of male infertility but it also seen that others hormones like thyroid hormones,LH, FSH and Testosterone and duration of marriage and blood sugar levels are involved in male infertility.[ ].we have studied 100 infertile couples and on the basis of clinical and hormonal and semen analysis, out of total number 100 study subjects 30%[n=30] couples have been found infertility due to male causes. It has been observed that 21 male subjects [n=21, 70%] out of 30 subjects with no spermatozoa in semen analysis. Hence these subjects were suffering from infertility from azoospermia and asthenospermia [n=2, 6%] and oligospermia [n=7, 23%]

Fourteen out of 30 subjects [n=14, 47%] with increased TSH more than normal range i.e.> 5.70Miu/ml. it has been indicated that male infertility due to hypothyroidism. Nine out of 30 subjects[n=9, 30%] with decreased serum Testosterone[2.6-10 ng/ml] and ten out of 30 subjects and twelve out of 30 subjects with increased serum LH and FSH respectively. Hence subjects of male infertility having relation with hormones findings.

As high as 90% of male infertility problems are related to count and is a positive association between the abnormal semen parameters and sperm count.[5] Analysis of retrospective data indicates that sperm counts may have declined in some parts of the world, but there seems to be geographical variations in the semen quality.[6,7,8] The reason for geographic variations in semen characteristics is not clear, but it may due to environmental, nutritional, socioeconomic, or other unknown causes.[9].Asthenospermia is associated with male infertility and it has been revealed in a large group of study population for long duration that decline in sperm motility with increasing age [10]. A variety of occupational exposures have been linked to impaired male fertility (11.).but in our study male infertility due to exposure in various environmental factors and occupational hazards is not included. Hyperglycaemia revealed some adverse effects on male reproductive function relative to altered endocrine control and decreased Sertoli cell vacuolization [12], decreased sperm production[13], decreased fertility[14], and also causes alteration of epididymis morphology.

SUMMARY AND CONCLUSION

Though our study samples includes a very small numbers of subjects, our observations have revealed that Total number of established diagnosed male infertility patients have been found 30[30%] out of 100 total study subjects.

Total number of established diagnosed azoospermia that showed to be [n=27, 70%] out of 30 total male subjects.

Total number of hypothyroid that causes male infertility that showed to be 14[47%] out of 30 total male infertile subjects.

Total number of decreased serum Testosterone that may be related with male infertility have been found to be 9 [n=9, 30%] out of total male infertile male subjects.

REFERENCES

1. Zegers-Hochschild F, Adamson GD, de Mouzon J, Ishihara O, Mansour R, Nygren K, et al. International Committee for Monitoring Assisted Reproductive Technology (ICMART) and the World, Health Organization (WHO) revised glossary of ART terminology, 2009. Fertil Steril. 2009; 92:1520–4.
2. Gynaecology, 3rd Edition, edited by Robert W. Shaw, W. Patrick Soutter and Stuart L. Stanton.
3. Men's Health – Male Factor Infertility. University of Utah Health Sciences Center. 04 January, 2003. Archived from the Original on 04 July 2007. [Last retrieved on 2007 Nov 11.
4. Lotti F, Maggi M. Ultrasound of the male genital tract in relation to male reproductive health. Hum Reprod Update. 2015; 21:56–83.
5. Sabra SM, Al-Harbi MS. An influential relationship of seminal fluid microbial infections and infertility, Taif Region, KSA. World J Med Sci. 2014; 10:32–7.
6. Auger J, Jouannet P. Evidence for regional differences of semen quality among fertile French men. Fédération Francaise des Centres d'Etude et de Conservation des Oeufs et du Sperme humains. Hum Reprod. 1997; 12:740–5.
7. Jorgensen N, Andersen AG, Eustache F, Irvine DS, Suominen J, Petersen JH, et al. Regional differences in semen quality in Europe. Hum Reprod. 2001;16:1012– 8. Swan SH. Semen quality in fertile US men in relation to geographical area and pesticide exposure. Int J Androl. 2006;29:62–8.
8. Fisch H, Goluboff ET. Geographic variations in sperm counts: A potential cause of bias in studies of semen quality. Fertil Steril. 1996;65:1044–6.
9. Mukhopadhyay D, Varghese AC, Pal M, Banerjee SK, Bhattacharyya AK, Sharma RK, et al. Semen quality and age-specific changes: A study between two decades on 3,729 male partners of couples with normal sperm count and attending an andrology laboratory for infertility-related problems in an Indian city. Fertil Steril. 2010;93:2247–54.
10. Sheiner EK, Sheiner E, Hammel RD, et al. Effect of occupational exposures on male fertility: literature review. Ind Health 2003;41:55–62.
11. Sabra SM, Al-Harbi MS. An influential relationship of seminal fluid microbial infections and infertility, Taif Region, KSA. World J Med Sci. 2014; 10:32–7.
12. Cameron DF, Rountree J, Schultz RE, Repetta D, Murray FT. Sustained hyperglycemia results in testicular dysfunction and reduced fertility potential in BBWOR diabetic rats. Am J Physiol 1990; 259(6): e881-889.
13. Jelodar G, Khaksar Z, Pourahmadi M. Endocrine profile and testicular histomorphometry in adult rat offspring of diabetic mothers. J Physiol Sci 2009; 59(5): 377-382. Back to cited text no. 33