DOI: 10.18410/jebmh/2015/580

ORIGINAL ARTICLE

IMPACT OF ALCOHOL ON HUMAN VITAL SEMINAL PARAMETER WHICH INFLUENCE FERTILITY

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HOW TO CITE THIS ARTICLE:
M. G. Abhishek. "Impact of Alcohol on Human Vital Seminal Parameter Which Influence Fertility". Journal of Evidence based Medicine and Healthcare; Volume 2, Issue 28, July 13, 2015; Page: 4081-4087, DOI: 10.18410/jebmh/2015/580

ABSTRACT: Alcohol has wide impact (affect) on male reproductive function like impotence, loss of sexual interest, gynecomastia and on male infertility. Alcohol can adversely affect the leydig cells which secretes the male hormone testosterone, Several studied have been conducted to evaluate the effect of alcohol in men and results shows reduced testosterone levels in the blood. Alcohol has dual effect on the hypothalamic pituitary – gonadal axis and blocking the release of LH-releasing hormone. 110 subjects were included in the present study amongst whom 25 were non-alcoholic, 53 with low alcoholic and 32 with high alcoholic intake. Our study shows that ethanol exhibits alteration in their spermatozoa concentration, abnormal motility and morphology.
KEYWORDS: Sperm motility, Total sperm count, Alcohol intake.

INTRODUCTION: The male reproductive system includes hypothalamus, the anterior pituitary gland and the testis. Alcohol consumption produces significant changes with each of these components.(1) Male infertility accounts 40% of infertile couples, This drag the attention on life style especially diet, alcohol, smoking and obesity and on reproductive health of such men.(2) Severed clinical and experimental studies have explained that alcohol consumption produces alternation in morphology of spermatozoa like breakage of the sperm head, half tail forms and tail curling's.(3,4)

The objective of the present study is to evaluate the effects of alcohol consumption on few selected seminal fluid parameters like sperm count, motility and morphology and to compare the result with other similar studied.

MATERIAL METHODS: This prospective study was conducted over a period of one year at clinical laboratory of our pathology department. The subject included in the study were male partners of age between 25 to 45years of infertile couples seeking treatments for primary infertily at our institute. The above study included 25 non-alcoholic and 85 alcoholic (53 low alcoholic-one who taking alcohol less than 60g and 32 heavy alcoholic-one who taking alcohol more than 60g).

SAMPLE COLLECTION: Semen samples were collected from the subject after complete abstinence of 4 days in a wide mouthed container, by masturbation making sure to include the first portion of the ejaculate since it contains the highest number of sperms.

The semen samples were analyzed after complete liquefaction. First the wet sample was assessed by placing 10µl of semen on a glass slide and covered with cover slip. Around 200 spermatozoa in 5 field at 200x magnification were counted for calculating the percentage of motility and grouped into 3 categories such as progressive motility, non-progressive motility and immobility.(5)

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Counting was done by using modified Neubauer counting chamber using the formula.[5]
Total sperm count = number of sperm count X 50.000/ml.
Morphology of individual spermatozoa is assessed by using pap stain.
Normal morphology of more than 70% is considered normal in our study.

INCLUSION CRITERIA:

1. Men with primary infertility.
2. Aged between 25 to 45 years.

EXCLUSION CRITERIA:

1. History of injury to testis, varicoele, hydrocele, undescended testis or its corrective surgery.
2. Male above 45 year of age.
3. History of prolonged medication, occupational exposure to chemicals or heat.
4. History of chronic illness like thyroid or Diabetes.

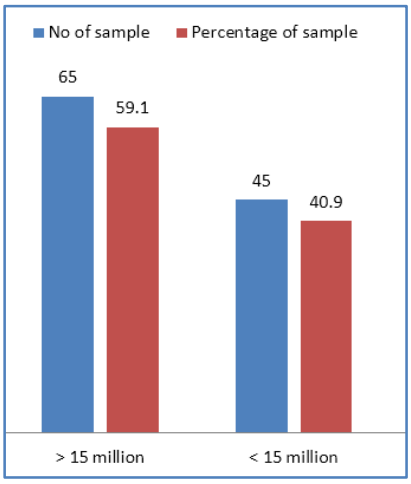
Sl. No.	Alcohol history	Numbers	Percent.
1	Non Alcoholic	25	22.8
2	Low Alcoholic	53	48.2
3	High Alcoholic	32	29.0
Total		**110**	**100.0**

Table 1: Entire study group

RESULTS:

Sl. No.	Sperm count (15mllum/ml)	Frequency	Percent.
1	Normal	65	59.1%
2	Low	45	40.9%
Total		**110**	**100%**

Table 2: Sperm count in entire study group



Graph 1: Bar graph showing sperm count in the entire study group

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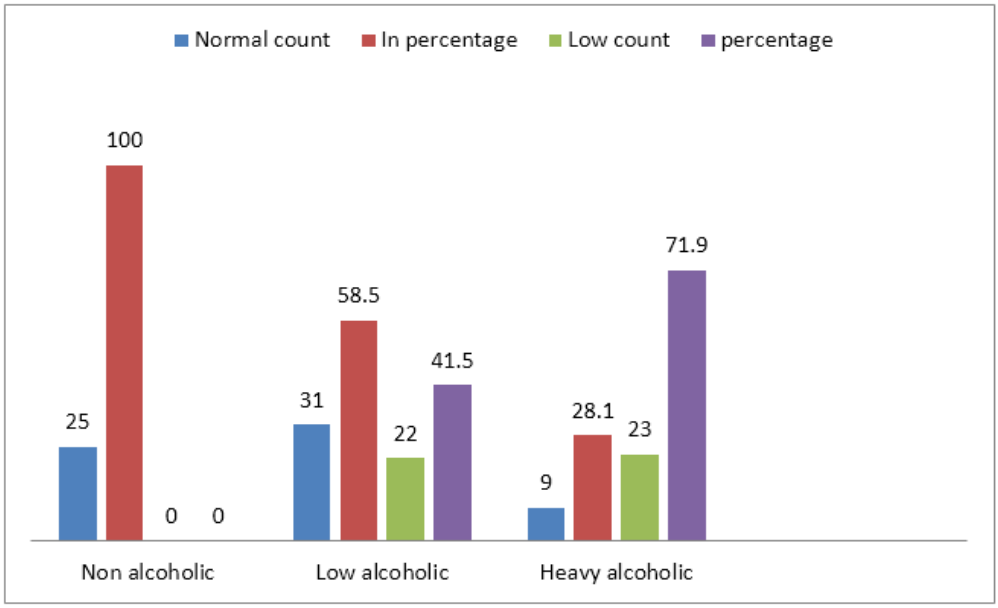
Sl. No.	Alcohol History	Normal count	Low count
1	Non Alcoholic	25 (100)%	0(0%)
2	Low Alcoholic	31(58.5%)	22(41.5%)
3	High Alcoholic	09(28.1%)	23(71.9%)
Total		**65(59.1%)**	**45(40.9%)**

Table 3: Comparative analysis of sperm count in non-alcoholic, low alcohol and heavy alcohol



Graph 2: Bar graph showing comparative analysis of sperm count in Non alcoholic and alcoholic

Sl. No.	Morphology	Frequency	Percentage
1	Normal morphology (greater than 70%)	42	38.2%
2	Abnormal morphology (less than 70%)	68	61.8%
Total		**110**	**100.0%**

Table 4: Sperm morphology in the entire study

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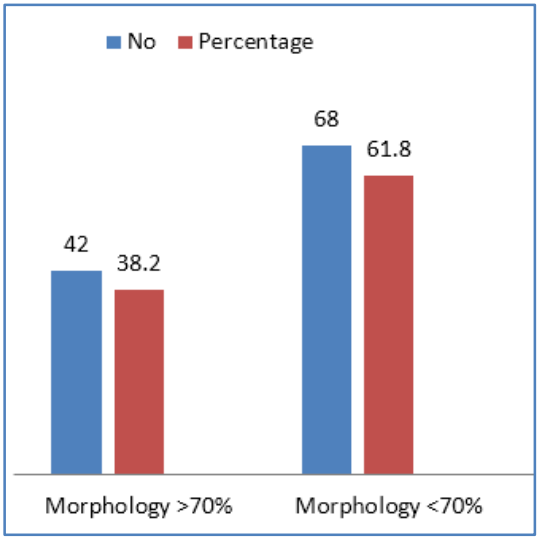
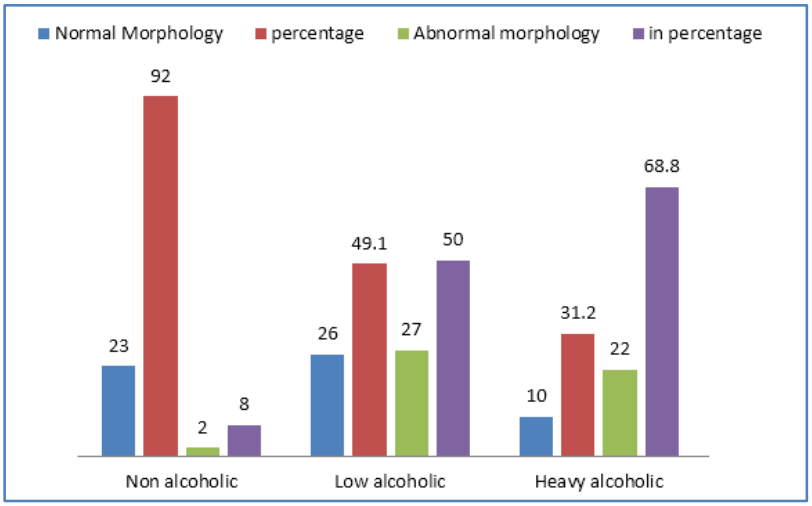


Graph 3: Bar graph showing morphology in the entire study group

Sl. No.	Alcohol history	Normal Morphology	Abnormal morphology.
1	Non Alcoholic	23 (92)%	02(8%)
2	Low Alcoholic	26(49.1%)	27(50%)
3	High Alcoholic	10(31.2%)	22(68.8%)
Total		**59(53.6%)**	**51(46.4%)**

Table 5: Comparative analysis of sperm morphology in non- alcoholic and alcoholic



Graph 4: Bar graph showing comparative analysis of sperm morphology in Non alcoholic and alcoholic

P value = 0.0001 Chi square=27.079 df=2.

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In our study of 110 alcoholic subjects, 45(40.9%) showed low sperm counts and 22(68.8%) heavy alcoholic, 27(50%) low alcoholic had abnormal morphology.since p value is less than 0.0001. in both parameter, the entire data was statistically significant.

Thus our study showed low and heavy alcoholic have dangerous effect on sperm count as well as sperm morphology but sperm morphology is severly effected in alcoholic compared to sperm count.

DISCUSSION: Many studies have proved the detrimental effect of alcohol on seminal parameter but its association with individual parameter is yet to be established.

Alcohol causes impaired testosterone production and thereby has great impact on infertility and impotence. It also has deleterious effect on sertoli cells,thereby decreasing LH,FSH production.[2,6]

The effectiveness of spermatozoa is measured by sperm count but sperm motility indicates epididymal maturation.[7,8]

According to previous research and studies among alcohol abusers group and non alcoholic group.the alcohol group members had significantly low plasma testosterone with low LH and FSH concentration and also associated with oligo-asthenozoospermia with increased oxidative stress.[9]

The present study showed decreased sperm motility and abnormal morphology like macrohead,half tail forms etc which was more evident in heavy alcoholic. (Table 3 & 5, Graph 2 & 4)

Out of 110 subjects,45 showed low sperm counts and 68 had abnormal morphology, Taking these two seminal parameters in to consideration, it was clearly observed that sperm morphology was more affected than sperm count.

A. A. Oremosu and E.N. Akany have reported that alcohol affects mitochondrial functions and increases oxidative stress induced change of plasma membrane of spermatozoa, since mitochondria produce ATP which helps in motility of flagella of sperms cells, results in reduced motility.[10]

The present study also showed increased number of abnormal morphological sperms which was again supported by the similar findings of Donnelly et al,[11,12,13,14,15] even Gomaths et al,[10] reported increased abnormality in sperm morphology among alcohol abusers.

CONCLUSION: Although some of the seminal parameters are not alfected by the alcohol but motility and morphology of spermatozoa are significantly altered. Alcohol has deleterious effect on Leydig cells and sertoti cells, thereby causing impaired testosterone, LHand FSH productions. This study once again proved that chronic alcohol consumption has detrimental effect on some of the seminal parameters like motility and morphology.

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Date of Submission: 06/07/2015.
Date of Peer Review: 07/07/2015.
Date of Acceptance: 10/07/2015.
Date of Publishing: 13/07/2015.