SOCIO-DEMOGRAPHIC CHARACTERISTICS AND OTHER CLINICAL CORRELATES OF PATIENTS WITH NORMAL AND ABNORMAL SEMINAL FLUID INDICES IN ILORIN, NIGERIA

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ABSTRACT

Several factors affect seminal fluid indices. These factors impair male fertility either by exerting a gonadotoxic effect on the testicles, altering hypothalamic-pituitary-gonadal axis, impairing ejaculation and erectile function or decreasing libido.

The aim of this study was to evaluate the socio-demographic characteristics and other clinical correlates of male partners of infertile couples with normal and abnormal seminal fluid indices in Ilorin, Nigeria

This was a cross sectional analytical study carried out at the University of Ilorin Teaching Hospital, Ilorin and four other centres that offer treatment for infertility in Ilorin. These are Anchor Medical Centre, Royal Care Clinic, Surulere Medical Centre and Mid-Land Fertility Centre. Three hundred and nine (309) male partners of infertile couples attending these fertility clinics were recruited using multi-stage sampling technique. A detailed history with emphasis on socio-demographic characteristics, drug use, medical and surgical history as well as sexual history was taken. A general physical examination including examination of the external genitalia and prostate gland was done. Seminal fluid analysis was conducted on each participant and compared with word health organization reference for normal semen parameters. Data obtained was analysed using Epi-infor 6.0 software.

The results showed that male partners of infertile couples with abnormal seminal fluid indices had increased pattern of sexual behaviour (number of sexual intercourse per week (P VALUE-0.0213), number of current sexual partners (p value-0.0074) and number of life time sexual partners (p value-0.0355) which is a risk for STIs as against their counterpart with normal seminal fluid indices. The study also showed a statistically significant association between alcohol intake and abnormal seminal fluid (p value-0.0003) as well as abnormal seminal fluid and cigarette smoking (p value-0.0001). however, no statistical significant association was noticed with the amount of alcohol use i.e moderate to heavy alcohol intake (p value-0.2668) and number of sticks of cigarette smoked (p value-0.6454). also no significant association was noticed between the use of native medications and abnormal seminal fluid indices (p value-0.9229).

STIS, alcohol intake and cigarette smoking still remain important risk factors for abnormal seminal fluid indices. Thus, it is important to re-educate and enlighten the populace on the risk posed by these social factors on their semen quality.

Key words: Alcohol, clinical correlates, demographic, genital infections, male infertility, seminal fluid indices, smoking.

BACKGROUND

Infertility is a global problem and public health concern in many parts of sub-Saharan Africa[1,2]. This is not only because of its high prevalence but also the important socio-cultural effect of the condition on affected couples and families[3]. Infertility remains a common gynaecological and social problem especially in sub-Saharan Africa where fertility reflects a woman's status[4]. It accounts for up to 60-70% of all gynaecological consultations[5]. Infertility affects 8-12% of couples worldwide. Its prevalence is 6% and 10% in the United Kingdom and United States of America respectively[6-7]. In sub-Saharan Africa, the prevalence of infertility is about 30-40%[8]. In Nigeria, the incidence of infertility varies from 20-30%[9].

Male factor implies a lack of sufficient numbers of competent sperm, resulting in failure to fertilize the normal ovum available evidence suggests that male infertility is an important but neglected reproductive health issues in Nigeria[10]. Published studies indicate that the male factor is present in 20 to 70% of the causes of infertility in different parts of the country[11]. Studies from several populations around the world indicate that smoking[12] type of occupation[13], alcohol and coffee intake[10] as well as nutritional factors affects male infertility local factors include infection such as tuberculosis[14] which can directly or indirectly damage the male reproductive system. Several sexually transmitted bacterial such as Neisseria gonorrhea and Chlamydia trachomatis have been linked with reduced fertility because of reduced sperm function[15].

There are reports indicating high rates of infertility among males attending sexually transmitted infection (STI) clinics in Nigeria[16]. Thus, it is relevant to assess the relationship between previous exposures to STIs, it would be relevant to determine the impact of polygamy and multiple sexual partners on semen quality and invariable on male infertility in our environment. Other risk factors include previous exposure to drugs, smoking and alcohol, concurrent medical illnesses, surgical procedures such as hernia and use of native medications.

Few studies have been done on male infertility in our centre but none has looked extensively into the socio-demographic characteristics and clinical correlates of patients with normal and abnormal seminal fluids indices in Ilorin. Identifying the several risk factors and their effects on seminal fluid indices will help in managing these couples especially where these factors are treatable or modifiable ones. This will help in reducing the cost of management of male infertility which is often out of reach of the average individual in our society today[10]. In addition, health education of the populace on these factors will prevent male infertility and reduce its incidence as a whole.

AIM AND OBJECTIVES:

The aim of this study is to evaluate the socio-demographic characteristics and clinical correlates of male partners in infertile couples with normal and abnormal seminal fluid indices in Ilorin, Nigeria.

SPECIFIC OBJECTIVES:

a. To determine the incidence of normal and abnormal semen fluid indices in the study population

b. To identify the pattern of semen parameters among male partners of infertile couples with normal and abnormal seminal fluid indices in the representative sample

c. To determine the socio-demographic and clinical characteristics of male partners in infertile couples with normal seminal fluid indices in the representative sample i.e the control

d. To determine the socio-demographic and clinical characteristics of male partners in infertile couples with abnormal seminal fluid indices in the representative sample i.e the subjects

e. To assess the differences and similarities in the socio-demographic and clinical characteristics in both groups

METHODOLOGY

The study was conducted at the Gynaecology Clinic of the university of Ilorin teaching hospital, Ilorin as well as specialist gynaecological clinics in Ilorin metropolis . These centres are Anchor Medical Centre, Royal Care Medical Centre, Surulere Medical Centre and Midland Fertility Centre The study population were male partners of infertile couples attending these Gynaecology Clinics in Ilorin during the period of study. Male partners of infertile couples with abnormal seminal fluid

indices represented the subject group for the study while male partners in infertile couples with normal semen indices represented the control group for the study.

However, these groups were delineated after carrying out seminal fluid analyses on the representative sample population.

The study was a cross-sectional analytical study. Inclusion criteria include all male partners in infertile couples who presented at the above stated clinics during the study period and had not commenced treatment were eligible for the study

Male partners who were currently receiving treatment for infertility at time of commencement of the study were excluded from the study.

4.4 SAMPLE SIZE DETERMINATION

Sample size was determined using the formular[47]

$N=\underline{z^2pq}/\ d^2$. Where n= sample size for the study, Z=standard normal deviation (a constant) which is 1.98 at 95% confidence interval and P=prevalence of male infertility (20%). Q=1-p. D=observed difference of 5% or more taken as being significant

$N=\underline{1.98 \times 0.2 \times 0.8}$

$(0.05)^2$ N=246.

Provision was made for attrition by adding 10% of the sample size i.e 25. Therefore, the minimum sample for the study was 271 subjects

Sampling was a multi-stage sampling technique. Over the period of study (1st August-31st December, 2011) with a systematic random sampling technique of one in every four, 162 participants were recruited from UITH, 65 participants from Midland Fertility Centre, 40 from Surulere Medical Centre and 21 from Anchor Medical Centre and Royal Care Medical Centre respectively. The selected patients were informed and counselled about the study. Only those who consented were included in the study

Research assistants were seven selected doctors, one from each of the three units in the department of Obstetrics and Gynaecology in UITH as well as the other four study centres, attending to the couples regularly in the Gynaecology clinics. They were trained on how to conduct the study and administer the questionnaire prior to its commencement, with the study objectives and protocol in mind. Their duty was primarily to help recruit patients for the researcher, based on the study criteria. The researcher later was also involved in recruiting patients from UITH. A laboratory scientist from the department of microbiology in UITH carried out the analysis of the semen samples after due orientation.

A detailed history was obtained and included age, educational status, ethnicity, marital status, occupation, history of smoking, alcohol intake, previous and current sexual history, past medical and surgical history, previous fertility history as well as drug history.

The participants were examined in privacy and groin examination was done in standing position in these clinics. A general physical examination was performed noting the height, weight, and body mass index (BMI). Physical examination included size, position and consistency of the testes, state of the vas deferens and epididymis, presence or absence of varicocele and the site of opening of the urethral meatus. A pinch type calliper (orchidometer) was used to assess the size of the testes.

The data collection sheet (questionnaire) was pre-tested for clarity of questions/information on 25 male patients been managed for infertility at the Urology Clinic of UITH.

4.7 COLLECTION AND ANALYSIS OF SEMEN

The standard WHO guideline for semen analysis was used. The participant abstained from sexual intercourse for three days before semen collection. The masturbation method was adopted for semen collection into the sterile wide mouthed container provided for the purpose. The semen samples were examined within one hour of collection to prevent dehydration or changes in temperature from affecting sperm quality (initial macroscopic examination of the appearance, viscosity and measurement of volume and pH was done). The presence of leucocytes in the preparation was also done.

The WHO guidelines were used for the classification of the various forms of semen abnormalities (see Appendix II)

DATA ANALYSIS

Data obtained were analyzed using Epi- Info version 6.0 software packages. The results were expressed as percentages and means with standard deviation and presented on tables and figures. The level of significance was tested using Chi-square, correlation analysis and t-test and p value of 0.05 was taken as significant.

ETHICAL CONSIDERATION

Approval for this study was obtained from the ethical committee of the University of Ilorin Teaching Hospital, Ilorin. Permission to use other study sites was also obtained from constituted authorities. Patients data was treated confidentially. Also, the study was explained to the subjects and their informed consent, which was documented, obtained before being included into the study.

RESULTS

During the period of the study (1st August-31st December, 2011) 309 male partners of infertile couples were involved in the study; 139 had abnormal semen parameters while 170 had normal semen parameters representing the subject and control respectively.

Table 1: Socio-demographic characteristics

Variable	Study (n=139) Frequency (%)		control (n=170) frequency (%)		p-value	
Age group (years)						
<30	20	(14.4)	13	(7.6)		
31-35	50	(36.0)	45	(26.5)		
36-45	36	(25.9)	46	(27.1)		
41-45	20	(14.4)	42	(24.7)	t=-1.57	
46-50	13	(9.4)	14	(8.2)	p=0.1173	
>50	7	(5.0)	10	(5.9)		
Mean ±Sd	37.91±7.32		39.18±6.75			
Educational Level						
None	5	(3.6)	3	(1.8)		
Primary	14	(10.1)	11	(6.5)	x^2=2.51	
Secondary	28	(20.1)	38	(22.4)	df= 3	
Tertiary	92	(66.2)	118	(69.4)	p vaue = 0.4735	
Occupation						
Manager	5	(3.6)	13	(1.2)		
Professional	34	(24.5)	13	(17.1)		
Cleric support workers	20	(14.4)	13	(22.9)		
Service & sales workers	25	(18.0)	13	(21.8)	x^2= 16.46	
Skilled agricultural forestry Fishery workers	2	(1.4)	8	(4.7)	df=8	
Craft & related trade workers	24	(17.3)	37	(21.8)	p=0.0362	
Plant & machine operators & assembler	7	(5.0)	5	(2.9)		
Elementary occupation	19	(13.7)	12	(7.1)		
Armed forces	3	(2.2)	1	(0.6)		
Total	139	(100)	170	(100)		
Ethnicity						
Yoruba	123	(88.5)	154	(90.6)		
Igbo	9	(6.5)	8	(4.7)	x^2=2.11	
Hausa	4	(2.9)	2	(1.2)	df=3	
Others **Edo, Ebira and Nupe	3	(2.1)	6	(3.5)	p value=0.5507	
Religion						
Islam	82	(59.0)	94	(55.3)	x^2= 0.43	
Christianity	57	(41.0)	76	(44.7)	df=3	
					P value=0.5135	
Family type						
Monogamy	127	(91.4)	13	(80.6)	x^2= 7.14	
Polygamy	12	(8.6)	13	(19.4)	df=1	
					P value=0.0075	

The social demographic characteristics of participants are presented in table I. There was a significant association between occupational type and abnormal seminal fluid indices. Abnormal seminal fluid indices were more revealed amongst managers (3.6% vs 1.2%) and professionals (24.5% vs 17.1%) compared with labourers and office assistants. Abnormal semen quality was also commoner in the age group 31 to 35 years (36% vs 26.5%). However, the age grouping of the subjects and control was not statistically significant. Thirteen (19.4%) of the control were polygamist as against 12 (8.6%) of the subjects.

Table 2: Experiences of sexual activity in subject and control groups

Variable	**study (n=139)** Frequency (%)		**control (n=170)** frequency (%)		p-value
No of sexual intercourse per week					
1	25	(18.0)	29	(17.1)	
2	72	(51.8)	59	(34.7)	
3	24	(17.3)	47	(27.6)	X^2=11.52
4	13	(9.4)	26	(15.3)	df=4
Not stated	5	(3.6)	9	(5.3)	p=0.0213
No of current sexual partners					
1	41	(29.5)	73	(42.9)	
2	63	(45.3)	32	(30.6)	x^2=12.00
3	19	(13.7)	34	(20.0)	df=3
>3	16	(11.5)	33	(19.4)	p=0.0074
Number of life time sexual partners					
One	82	(59.0)	122	(71.8)	
Two	47	(33.8)	41	(24.1)	x^2=8.57
Three	7	(5.0)	6	(3.5)	df=3
More than three	6	(4.3)	1	(0.6)	p value=0.0355
Total	139	(100.0)	170	(100.0)	

The reported pattern of sexual activity in subjects and controls are presented on table II. Most of the subjects (51.8%) had sexual intercourse twice a week.

Majority of the subjects also had more than one current sexual partner (70.5%) as against (57.1%) of the control. In addition, having more than three (3) life time sexual partners was more in the subjects than the control (4.3% vs 0.6%) and this was statistically significant (p value-0.0355).

Table III: number and percentages reporting symptoms and treatment of STIs by fertility status

Variables	study (n=139)		control (n=170)		
	Frequency (%)		frequency (%)		p-value
Penile discharge	**41**	**(29.5)**	**54**	**(31.8)**	**p=0.6672**
Treated	39	(95.1)	42	(77.8)	
Not treated	2	(4.9)	45	(22.2)	p=0.0384
Painful urination	**39**	**(28.1)**	**46**	**(46.8)**	**p=0.05963**
Treated	36	(92.3)	26	(73.8)	
Not Treated	3	(7.7)	17	(26.2)	p=0.03981
Itching in genital area	**45**	**(32.4)**	**63**	**(37.1)**	**p=0.3902**
Treated	44	(97.8)	33	(74.6)	
Not Treated	1	(2.2)	33	(25.4)	p=0.0027
Genital Ulcer	**6**	**(4.3)**	**33**	**(14.7)**	**p=0.0024**
Treated	6	(100.0)	33	(40.0)	p=0.0185
Not Treated	0	(0.0)	33	(60.0)	
Testicular swelling	**3**	**(2.2)**	**33**	**(5.3)**	**p=0.1557**
Treated	3	(100.0)	33	(22.2)	p=0.0454
Not Treated	0	(0.0)	33	(77.8)	
Testicular pain	**2**	**(1.4)**	**33**	**(6.5)**	
Treated	2	(100.0)	33	(9.1)	p=0.0283
Not Treated	0	(0.0)	33	(90.9)	p=0.0384

The patterns of treatment seeking for reported symptoms of STIs and pattern seeking for reported STIs symptoms are presented on table III for subjects and controls. The control group reported more of the symptoms of STIs. However, their health seeking behaviour was less than of the subject group.

Table IV: Medical History

Variable	**study (n=139)**		**control (n=170)**		
	Frequency (%)		frequency (%)		p-value
Hypertension					
Yes	26	(18.7)	17	(10.0)	
NO	113	(81.3)	153	(90.0)	p=0.0278
Diabetes Mellitus					
Yes	11	(7.9)	4	(2.4)	
No	128	(92.1)	166	(97.6)	p=0.0458
Sickle cell disease					
Yes	4	(9.4)	0	(0.0)	
No	135	(97.1)	170	(100)	p=0.3997

Table IV compared the subjects and control based on their medical history namely history of hypertension, diabetes mellitus and sickle cell disease. History of hypertension and diabetes mellitus showed a significant correlation with abnormal seminal fluid indices.

Table V: Surgical History

Surgeries	**study (n=139)**		**control (n=170)**		
	Frequency (%)		frequency (%)		p-value
Past Surgical History					
Herniorrhapy	3	(2.2)	17	(1.8)	
Varicocelectomy	3	(2.2)	153	(1.2)	x^2=0.93
Orchidopexy	1	(0.7)	4	(0.0)	df=3
Orcidectomy	1	(0.7)	166	(0.6)	p=0.8173

Table V showed the surgical history of the subjects and control. This was not statistically significant (p value=0.8173).

Table VI: infertility Type

Infertility type	**study (n=139)**		**control (n=170)**		
	Frequency (%)		**frequency (%)**		**p-value**
Past Surgical History					
Primary	80	(57.6)	91	(54.1)	x^2=0.93
Secondary	59	(42.4)	78	(45.9)	df=1
Total	139	(100.0)	170	(0.0)	p value=0.5452

Table VI showed no significant difference between the two groups based on the type of infertility they had (p value= 0.5452).

Table VII: Duration of Infertility

Duration of infertility	study (n=139)		control (n=170)		
	Frequency (%)		frequency (%)		p-value
1yr	25	(18.0)	34	(54.1)	x^2=0.93
1-3yrs	57	(41.0)	77	(45.3)	df=1
1-6yrs	80	(23.0)	41	(24.1)	x^2=0.93
1-9yrs	59	(5.0)	6	(3.5)	df=1
1-12yrs	80	(4.3)	9	(5.3)	x^2=0.93
>12yrs	59	(4.3)	3	(1.8)	df=1
Total	139	(100.0)	170	(100.0)	p value=0.5452

Majority of the study population had had infertility of more than 1 year although no statistical significant difference was noted between the two groups (p value=0.7513) (Table VII).

Table VIIIa: History of cigarette smoking

Cigarette smoking	study (n=139)		control (n=170)		
	Frequency (%)		frequency (%)		p-value
Yes	26	(22.3)	17	(7.1)	x^2=14.83
NO	113	(77.7)	153	(92.9)	df=1
Total	139	(100.0)	170	(100.0)	p value 0.0001

Table VIIIb: Severity of smoking

Quantity	study (n=139)		control (n=170)		
	Frequency (%)		frequency (%)		p-value
Mild	22	(15.8)	10	(5.9)	x^2= 0.88
Moderate	8	(5.8)	2	(1.2)	df=2
Severe	1	(0.7)	0	(0.0)	p value-0.6454

Table VIII compared the pattern of smoking between the subjects and the control. Smoking was shown to be a significant risk factor with a p value of 0.0001. however, the degree of smoking as shown by the number of sticks of cigarette smoked was not statistically significant (p value 0.6454).

Table IXa: Alcohol intake amongst subjects and controls

Alcohol intake	study (n=139) Frequency (%)		control (n=170) frequency (%)		p-value
Yes	46	(18.7)	27	(15.9)	x^2=112.55
NO	93	(81.3)	143	(84.1)	df=1
Total	139	(100.0)	170	(100.0)	p value=0.0003

Table IXb: Degree of alcohol intake amongst the subjects and controls

Variables	study (n=139) Frequency (%)		control (n=170) frequency (%)		p-value
Standard	10	(7.2)	12	(7.1)	
Moderate alcohol use	18	(12.9)	153	(5.9)	x^2=6.52
Heavy alcohol use	13	(9.4)	5	(2.9)	df=3
Binge drinking	5	(3.6)	0	(0.0)	p=0.08889

Table IXc: History of Alcohol intake

Variables	study (n=139) Frequency (%)		control (n=170) frequency (%)		p-value
Moderate Alcohol use	18	(12.9)	10	(5.9)	x^2=2.64
Heavy Alcohol Use	13	(9.4)	5	(2.9)	df=2
Binge Drinking	5	(3.6)	0	(0.0)	p=0.2668

Table IX compared the alcohol intake habit of the subjects and control. Alcohol intake was shown to be a significant risk factor for abnormal seminal fluid indices (p value-o#0.0003). Table 9b showed that majority of the subjects took more than a drink per day (25.9%) vs 8.8% in the control group. However, the amount of alcohol intake was not statistically significant (p value-0.8889).

Table X: Use of Native Medications

Variables	study (n=139) Frequency (%)		control (n=170) frequency (%)		p-value
Positive	88	(63.3)	120	(60.0)	
Negative	51	(36.7)	68	(40.0)	p=0.0278
Total	139	(100.0)	170	(100.0)	p=0.9229

There were no statistically significant differences in the reporting of the study population to the use of native medication (pvalue-0.9229). 63.3% and 60% of the subjects and controls respectively affirmed to native medication use.

Table XI: Use of orthodox Medications

Other Drugs	Study (n=139) Frequency (%)		control (n=170) frequency (%)		p-value
Aldomet	1	(20.0)	4	(44.4)	
Cimetidine	1	(20.0)	0	(0.0)	
HAART	1	(20.0)	1	(11.1)	
Nifedipine	1	(20.0)	1	(11.1)	x^2=3.98
Moduretic	1	(20.0)	1	(11.1)	
Norvasc	0	(0.0)	1	(11.1)	df=6
Metformin	0	(0.0)	1	(11.1)	
Total	5	(100.0)	9	(100.0)	p=0.6791

Table 11 showed no significant difference in the use of orthodox medications

Table XII: Underwear use

Type of Underwears		**study (n=139)** Frequency (%)		**control (n=170)** frequency (%)	p-value
Boxers	110	(79.1)	137	(80.6)	
Pants	12	(8.6)	9	(5.3)	x^2=2.52
Pants/boxers	6	(4.3)	5	(5.3)	df=3
None	11	(7.9)	19	(11.2)	x^2=0.4717
Total	139	(100.0)	170	(100.0)	

The response was similar for use of boxers and showed non statistically difference between the subjects and the controls (p value-0.4717).

Table XIII: Comparison of body mass index (BMI)

BMI class	study (n=139)		control (n=170)		
	Frequency (%)		frequency (%)		p-value
Underweight	6	(4.3)	4	(2.4)	
Normal	68	(48.9)	95	(55.9)	p=0.2979
Overweight	41	(29.5)	52	(30.6)	df=3
Obese	24	(17.3)	19	(11.2)	x^2=3.68
Total	139	(100.0)	170	(100.0)	

Twenty four (17.3%) of the subjects were Obese vs 11.3% of the control. However, BMI did not show any statistically significant difference between subjects and control (p value-0.2979).

Table XIV: Testicular size

Testicular Size (ml)	study (n=139)	control (n=170)	
	Frequency (%)	frequency (%)	p-value
Mean±Sd	13.42± 3.19	16.5± 3.90	p value-0.0000

The testicular volume was statistically significant and correlated with the quality of semen produced (p value-0.0000).

Table XV: Pattern of semen abnormality

Variable		study (n=139) Frequency (%)		control (n=170) frequency (%)	p-value
Semen count					
Total Sperm Count Abnormality					
	Azoospermia	18	(12.9)	0	(0.0)
	severe Oligozoospermia	47	(33.8)	0	(0.0)
	Oligozoospermia	57	(41.0)	0	(0.0)
	Normal	17	(12.2)	170	(100.0) p=0.000
Mobility					
	Asthennozoospermia	69	(49.6)	0	(0.0)
	Normal	70	(50.4)	170	(100.0) p=0.000
Morphology					
	Teratozoospermia	13	(9.4)	0	(0.0)

Sixty nine (49.6%) had asthennozoospermia and represented the commonest semen abnormality. This was followed by oligozoospermia accounting for 41% of semen abnormality. Teratozoospermia was the least common semen abnormality with 9.4% incidence.

DISCUSSION

The study was aimed at identifying the risk factors for abnormal seminal fluid indices in Ilorin, Nigeria. Three hundred and nine (309) male partners in infertile couples were recruited for the study. One hundred and thirty nine (139) male partners in infertile couples had abnormal seminal fluid indices, and these represented the subjects.

The study revealed an incidence of 55% and 45% for normal and abnormal semen parameters amongst male partners in infertile couples in Ilorin respectively. The incidence of abnormal semen parameters is comparable to the findings in Enugu but less than what was reported in Maiduguri, Osogbo and Jos. This reported incidence may not be unrelated to the appropriate health seeking behaviour of the study population which can be inferred from table 3. It is also less 72% reported in a study done in Ilorin about 10 years ago. The difference, in addition, may be due to increase in the number of formal health sector providers in Ilorin.

The results also showed that the commonest semen variable was asthenozooospermia was the commonest semen count abnormally accounting for 46.7% of total sperm count abnormalities. This is comparable to 44% reported for asthenozoospermia at Onitsha but less than 58.2% reported at Kano. The percentage obtained for oligozoospermia in this study was more than that obtained at Onitsha.

The result showed a statistically significant association between abnormal seminal fluid indices and alcohol intake (p value-0.0003) but not with the amount of

alcohol consumed i.e moderate to heavy alcohol intake (p value-0.2668). This is contrary to the results from other populations which showed a link between moderate to heavy alcohol intake and male infertility. The mechanism underlying this relationship may not be totally clear but has been ascribed to the resultant decrease in serum testosterone concentrations and invariable spermatogenesis. There may also be impairment in spinal reflexes reducing sensation and innervations of the penis and this may contribute to erective dysfunction.

However, the hypothesis that moderate to heavy alcohol intake may be a consequence of males remaining infertile and not necessarily a causative factor of abnormal seminal fluid indices could be the reason for the result obtained from this study. Also, the fact that this study was based on self reporting may explain the discrepancy in the results (Tables IX a,b,c) as most of these patients may have been modest in their answers to the quantity of alcohol they consumed.

The results also showed no significant association between the use of native medication and abnormal seminal fluid indices. Most male partners in infertile couples reported having used native medications. However, the direction of this effect is unknown and the extent to which native medication suppress or impair spermatogenesis is not known. Some men are known to use native medications as a form of treatment of male infertility whereas others use native drugs as a habit or for treatment of some other illnesses. The difference in the results when compared with the study carried out in Benin, though ascribed to artefact, can also be thought to be

related to the difference in the content and amount of these native medications consumed. However, this was not explored in this study.

The results showed a statistically significant difference in the pattern of reported sexual behaviour (i.e number of sexual partners and sexual frequency) between the subject and control groups. However, undergoing early and appropriate medical treatment for these conditions placed the subjects at no increased risk of having abnormal seminal fluid indices. This further supports the positive health seeking behaviour of these patients. It could be inferred that they did not only seek health care but also used formal health sector providers. This is in contrast to the observation in Benin where infertile males were more likely to self-treat or use informal health sector providers (traditional healers, chemists and patent medicine sellers). Although seminal fluid cultures were not done in this study, it could be inferred that past genital infections were unlikely due to organisms such as Neisseria gonorrheae, chlamdia trachomatis and tuberculosis which are known to reduce sperm quality and function.

Other important associations obtained from the study were from occupational type and medical history. Managers, senior officials, professionals and technicians were more likely to have abnormal seminal fluid indices. This was similar to the results in some studies. The reason for this may not be unrelated to their work demand and exposure to harmful agents such as electromagnetic field. It may also be as a result of their financial capability which indirectly influences their sexual habits

and puts them at risk for STIs. Abnormal seminal fluid indices was also commoner in the elementary workers group, i.e office attendants and labourers. For this group of workers, it may be a reflection of their health seeking capability which may be related to their low socio-economic status.

Cigarette smoking also showed a statistically significantly association with abnormal seminal fluid indices in this study (p value-0.00010). this was however, independent of the number of sticks of cigarettes smoked (p value-0.6454). this is contrary to published findings in other populations but similar to the result obtained in Benin. The difference in this result (between table 8a, and 8b) may be due to the fact that it was based on self reporting as these patients may have been modest in their answers to the number of sticks of cigarette smoked.

Also contrary to the belief that wearing of tight or constrictive underwear's was a risk factor to male infertility, this study showed no statistically significant association between the type of underwear and abnormal seminal fluid indices. This may be seen to corrobate the findings that wearing of constrictive underwear causes no changes in sperm parameters, no decrease in spermatogenesis and no changes in sperm function.

Body mass index has no statistically significant association with abnormal seminal fluid indices in this study. This is contrary to a previous study carried out in this centre. The difference could be due to the population of the subjects studied

and the fact that this study also included the underweight and overweight BMI group which was not looked into in the previous study.

Other important clinical associations were those with testicular size as well as medical history of hypertension and diabetes mellitus.

The average testicular volume of this study group was less than the lower value for normal testicular volume (15ml) obtained using an orchidometer. The significant association between abnormal seminal fluid indices and reduced testicular size may be due to the gonadotoxic effect of some of the other factors on the testicles in addition to other mechanisms through which they alter male fertility.

The relationship between hypertension, diabetes mellitus and abnormal seminal fluid indices may be related to the vasculopathy which these medical diseases cause and as a result impair spermatogenesis and ejaculation mechanism

CONCLUSION

Although the result study showed a significant association between patter of reported sexual behaviour and abnormal seminal fluid indices, it also highlighted the importance of appropriate care from formal health providers for the treatment of these infections as a key factor to preventing abnormal semen quality.

Alcohol intake and cigarette smoking were also important risk factors for abnormal seminal fluid indices. This study however, did not show any statistically significant association between moderate and heavy alcohol intake as well as with the use of native medications.

Thus, our social life style still remains important risk factor to our health status and in this case, the quality of seminal fluid an individual produces.

RECOMMENDATIONS

Based on this study, the following recommendations are offered.

- There is the need to re-educate the public on the importance of early and appropriate treatment for STIs from formal health care providers as this will assist in ameliorating the long term sequel of STIs which may result in infertility.

- The content and quantity of native medication should be put to further research so as to identify the reasons for the difference in outcomes noticed in the different study population.

- A large population based study is also recommended to corroborate or otherwise refute the findings of this study. Where possible, the amount of alcohol, and the degree of nicotine in the respondents' system could be accessed and assessed for better correlation with seminal fluid indices.

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