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Management of Infertility within Primary Health Care Program in Sudan

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ABSTRACT

The objective of this study was to incorporate the control and management of infertility within the framework of maternal and child health and family planning program in primary health care setting. It was a cohort study and was held in central of Sudan, from June 2007 to June 2009. It was conducted in four health centers. Sample size was 200 infertile couples, selected by taking 10% from total number of all married female patients visited primary health care center complaining from any health problem during one month. Data were collected by special questionnaire includes, demographic data, medical history and examination, investigations and management. Data collection was performed by the author, doctor, midwife and nurse of each health centre. Investigations were done within the laboratory of health centers which include; blood test, urine analysis, seminal analysis, hormonal assay, high vaginal swap for culture and sensitivity, histosalpingiography and ultra sounds were done in the central laboratory. Outcome results were; 80% had primary infertility and 20% had secondary infertility. Infertility due to husbands alone was 20.5%, that due to wives alone was 37.5% and infertility due to both couple was 31% while those with unknown aetiology was 11%. The main cause of female primary infertility was unovulatory cycle and for secondary infertility were tubal problems. Male infertility due to seminal abnormality was 42.5% and those with medical problem was 2%. Management varied from health education, hormonal therapy, antibiotic and surgical intervention. By the end of the first year, 52 women got pregnant. Outcome was 48 well new born babies.

Key words: Infertility, management, health education, hormonal therapy, Sudan

INTRODUCTION

Infertility is a medical problem that affects a vast proportion of the world's young population (10-15%) (Yao and Schust, 2002), there is no agreement on a single definition. While the incapacity to conceive is the problem from a clinical perspective, the incapacity to deliver live births is the problem for demographers (Zegers *et al.*, 2008). Irrespective of the definition used, the inability to bear children seriously impacts the psychosocial and emotional lives of couples facing this condition. A large proportion of the world's population has no access to medical treatment for infertility and even in developed and emerging economies there are great inequalities in access to proper diagnosis and treatment (Zegers *et al.*, 2008). Infertility in this study is defined as inability to conceive after one year of unprotected adequately time intercourse (Berek, 1997). It has two types, primary infertility; it is a term used for a couple who have never achieved a pregnancy. Secondary infertility referred to a couple who have previously succeeded in achieving at least one pregnancy even if this ended in abortion (Larsen *et al.*, 2006). The prevalence and aetiology of infertility vary from place

to others all over the universe, it may depend on the influence of religion and region (Jejeebhoy and Sathar, 2001) and also on the type of the studies and the place where they were conducted, for example (Almroth *et al.*, 2005) shown that two million American women of reproductive age were infertile in 2002 and aetiology of infertility was also common among men. Other study in USA estimated the prevalence of infertility as one in 7 couples, while in Africa these studies related the main cause of infertility to tubal problem. In the western world ovulation disorder and male factors were the common causes (Gorkemli *et al.*, 2006). Generally infertility is a multifactorial condition with more than one factor contribute to have the disease (Wilkins *et al.*, 2010). Management depend on health education, antibiotics for infections and hormonal therapy like induction of ovulation and or surgical intervention as in tubal blockage also diagnostic laparoscopy and hystero-salpingo-graphy will give enough insight into this problem. Micro-surgery is sometimes indicated to correct a tubal blockage. Sometimes the uterus is responsible for the problem, the diagnosis of which is usually made by hysteroscopy. Assisted treatment includes artificial insemination in cases of hypospadias, premature ejaculation and impotence, in which the husband's semen is collected by masturbation and is deposited in the upper part of the vagina. Intra-Uterine Insemination (IUI): the semen is processed to eliminate the debris and dead sperms. Good-grade motile sperms are then transferred into the uterine cavity by use of a catheter designed for this purpose. Intra-Cytoplasmic Sperm injection: in cases of severe absence of sperm formation and IVF. Investigations and treatment of infertility are always time consuming, expensive and in developing countries raise moral problem to the female side.

Sudan is the largest country in Africa most of its population lives in rural areas. The country facing manifold problems including low socioeconomic status, transportation, education and health. One of these health problems is infertility. In literature, it is generally believed that the prevalence of infertility in sub sharan areas is 10% of all couples (Yao and Schust, 2002). This figure seems to have built momentum as it is repeated frequently without very much documentation concerning its validity. This also applied to Sudan, where there is no actual study done recently to assess the magnitude of infertility. There are many perspectives for the impact of infertility. These include psychological, economical and socio-cultural factors which affect the infertile woman and the whole community. In Sudan the traditional emphasis of a women's role is defined in terms of her fertility, her whole social personal security may depend on it. Therefore doctors and health authorities should invest in improving information, education and counseling on issues pertaining causes and treatments of infertility and in drawing up guidelines for the management of infertility at all levels of health care. By this they will bring out most of treatable cause of infertility and hence to avoid expensive, time consuming and usually inconclusive procedures, to make live easy for all infertility couples and increase fertility in Sudan.

MATERIALS AND METHODS

This study was conducted in Wad Medani city, Gezira state (central Sudan) from June 2003 to June 2005. It is a cohort study and it was community based one. From 19 primary health care centers in the city four primary health care centers were randomly selected taking in consideration so that they represent the whole city. They are; Police, Banat, Eldibagha, Gezira health centers. A well designed management program was established which depend on the basic idea to incorporate management of infertility health problem within the frame work of family planning

program run by primary health care centers (PHCs). This program started by refreshment training course given to all staff of the primary health centers including; doctor, midwives, laboratory technicians and nurses about all aspects of infertility. Depending on the prevalence of infertility in sub-Saharan area found in literature which is 10% (Yao and Schust, 2002). Sample size were selected randomly and calculated as 10% of the total number of married females' patient coming to the health center during one month. The total number was 200 infertile couples. Individual consent was secured after a clear explanation to them about the program objective and content. A special questionnaire was designed for interviewing the couples, it includes: full medical history of both wife and husband, history of sexual intercourse (the frequency and timing), physical examination, investigations and management. Most of the investigations done in the laboratories of the health centers, those are Hemoglobin percentage, TWBC, ESR, urine analysis and seminal analysis. Other tests were performed in: National laboratory, they include microbiology for high vaginal swab for culture and sensitivity, reproductive hormonal immune assay for all wives using radio-immunoassay (RIA), Ultra Sound (U/S) and hysterosalpingography (HSG). All investigations above done by: the author, laboratory technicians working in each health centers and radiology technicians.

HSG: In this test Urographin was used as radio - opaque contrast medium. This procedure done within day 6 to day 9 from the first day of the cycle and before having any sexual intercourse.

Hormonal assay: In this study four reproductive hormones were estimated, luteinizing Hormone (LH), Follicular Stimulating Hormone (FSH), Prolactin and progesterone, they were done in day 21 from the first day of the cycle. A blood level of progesterone more than 20 nmol L⁻¹ indicates ovulation. Prolactin hormone level done in day 3-5 from first day of the cycle, a blood level more than 600 nmol L⁻¹ consider high level. It was done by the method of Immuno-Radiometric Assay (IRMA).

Final result of seminal analysis depends on WHO classification. Which is: the volume will be more than 2 mL. The sperm count is as following; Normal sperm count >20 million per H.P.F, Moderately oligospermia >5 million but <20 million. Sever oligospermia <5 million, Azoospermia is no spermatozoa seen. The sperm motility, more than 60% of the sperms will be actively motile after production (within half an hour). The shape, more than 60% of spermatozoa should be normal in shape. Any husband with a sperm count less than 20 million asked to repeat the test after 2-3 weeks with avoidance of intercourse for 3-7 days prior to the test. Management started in health centers with special referral to those need surgical intervention.

Other specialized tests were performed in: Surgical department in Wad Medani teaching Hospital for testicular biopsy.

RESULTS

Sample size was 200 female and male. Females age range from 18 to 49 years. Around 90% of them had different level of education, while illiteracy presented in 10%. For males their age range from 19 to 60 years old. About their educational level around 11.5% were illiterate. Concerning occupation only 5% of the female had jobs, the rest were house wives, while 56% of the men work in hard physical jobs. The economic status of the infertile couples, the mean monthly income was

460 Sudanese pounds (around 300\$ at the time of the study) that mean the majority of them lie in the moderate socioeconomic class (Elussein *et al.*, 2008). Duration of infertility vary from 1 year to 28 years, around 49% of the infertile couples their complain continued from 3 to 8 years. This is a normal behavior of Sudanese women; they seek medical advice after the end of the first year of marriage. The main complain of 63% of wives was inability to conceive other complains were; irregular menstrual cycle, vaginal discharge and abdominal pain. Around 75% of infertile women had family history of hypertension and diabetes and those with the same problem of infertility within their families were 45%. For male the majority had no complain but some of them had hypertension (10 men) and 6 of them had diabetes. Around 20% had past history mumps in their childhood. Final results after full investigations reveled that; 79.5% from all couples were suffered from primary infertility and 20.5% had secondary infertility. Infertility due to husbands only was 20%, that due to wives alone was 37.5% and infertility due to both partner was 31%. While those with unknown aetiology were 11%. The main etiological factor for primary infertility was unovulatory cycle, which exists in 69.5%. For secondary infertility the main cause was tubal problems in 18%. Half of the studied group suffered from vaginal infection. For male infertility the end result of seminal analysis revealed that 42.5% out of the total number of the study group had abnormal seminal results. Those with abnormal physical findings were 12% which include testicular abnormality, hypospadias, hypertension and diabetes. The impact of Sexually Transmitted Diseases (STD) on male fertility is strongly dependent on the local prevalence of the STDs, but in this study there was no single case of STDs which might be mainly due to religious background. There were few cases of urethritis but acute urethritis could not be associated with male infertility.

Management of infertile couples started by the staff of the health centers and it varies from health education, hormonal therapy, antibiotic and surgical intervention. For female, all of them received health education about personal hygiene and suitable time of ovulation. Around 63% received combined therapy which is antibiotics and hormonal therapy. Only 9% had surgical intervention in form of dilatation and curettage(D and C). the results shown in Table 1. About management of infertile male 2 of them were abroad, all of them received health education about pregnancy, ovulation and timing of intercourse. Almost half of them received medical therapy, 7 of them had surgical intervention inform of testicular biopsy. Results shown in Table 2. By the end of the first year, 52 women got pregnant and the outcome was 48 well new born babies 4 females had abortion (Table 3), classification of their management shown in Table 4.

Table 1: Female treatment (200 female)

Type of treatment	Frequency	Percent
Health education	200	100.0
Antibiotics	22	11.0
Hormonal therapy	42	21.0
Combined therapy	126	63.0
Surgical intervention	9	4.5

Table 2: Management to the husbands (198 male)

Type of treatment	Frequency	Percent
Health education	198	99.0
Medical treatment	90	45.0
Surgical treatment	7	3.5

Table 3: Outcome of the management after one year

End result	Frequency	Percent
Full term pregnant result in well born baby	48	24.0
Pregnancy ended with abortion	4	2.0
On treatment	117	58.5
Not compliance	8	4.0
No response	23	11.5
Total	200	100.0

Table 4: Management classification for successful cases (52 case)

Management	Frequency	Percent
Health education only	12	6
Treatment for hyperprolactinemia	26	13
Antibiotics for vaginitis and urthritis	14	7

DISCUSSION

Worldwide the over incidence of infertility related to both male and female factors continue to rise despite many advances in reproductive technology (Prasad and Dunbar, 2000; Elussein *et al.*, 2008). Obviously infertility is a multifactorial and medico social problem, in some countries it accounts for 40% outpatient gynecological consultations (Ilesanmi, 1995). In our study infertility factors showed that, the age distribution of the study population was based on the international scale, majority of female lay in the age group of 35-39 years old. From this age group there were 9 women represented with secondary infertility while 69 women have primary infertility. Hence the age played a significant role in female aetiology of infertility and average years in which the infertile woman consult a doctor was 2-4 years after marriage, this indicate delayed age of marriage, which might play a role in the etiology of their infertility. Hence 90% of the couples were educated so they can explain their problem clearly and follow the instruction of management (treatment and health education). The majority of our study group was from middle socioeconomic class the thing which can affect their continuation in seeking management for their problem. Around 90% of the female had past history in receiving treatment for their problem, while only 5% of males seek medical advice before. This usually happen was both invasive and non invasive investigations were applied more frequent to the female partner than male partner (Helmerhorst *et al.*, 1995).

The main etiology of female primary infertility was unovulation that due to high level of prolactin in 95 females. Other investigations like skull x-ray and CAT scan which were needed for diagnosis of hyperprolactinemia were not done in this study. This indicates that the problem of hyperprolactinemia which was the main cause of primary infertility in females can be solely diagnosed by hormonal assay (Prolactin level) which is affordable to most families and not so expensive like other diagnostic tools. Vaginal infections was present in 34%, this might be due to the social tradition in Sudan in which female genital mutation FGM (also called fornic circumcision) that took place during childhood (Cundiff *et al.*, 1995; Elmusharaf *et al.*, 2006). Tubal abnormality detected by hysterosalpingogram, which is a more economical and elementary method suitable for evaluation of endometrial and tubal pathologies (Stanley *et al.*, 1985). Tubal occlusion usually results from chronic infections, in this study this was less than that cited in the literature (Jackobson, 1993). WHO study in Africa stated that the main reason of infertility was due to tubal occlusion in 70% of infertile studied women (Sakar *et al.*, 2008) this is against our study were owing

to the percentage of tubal occlusion was less. The main etiology of male infertility was past history of mumps infections that because there was no proper vaccination for mumps in Sudan. Other causes were trauma and congenital abnormality but there was no single case of STD this is not going with (Ochsendorf, 2008) study on STDs and its effect on male infertility showed that STDs is high in Africa. The management depends on health education for all couples, 12 out of 52 couples succeeded to get pregnant only after having health education about ovulation and timing of intercourse. Other types were antibiotic for virginitis and urethritis, hormonal therapy (Clomiphene) for ovulation induction and supplementary treatment for males, in form of vitamins E and C. The end results was 52 female got pregnant 48 ended with full term babies and 4 females ended with abortion. As stated above, certain protocol for management of infertile couples by health authorities will help, organize the health services and reduce expenses to these families. There are some studies done in this field; a study done by (Elussein *et al.*, 2008) about clinical patterns and major causes of infertility among Sudanese couples, the study done in specialized Fertility Center. They studied 710 infertile couples. The final percentage of primary and secondary infertility was almost the same and also the contribution of both couple in the problem. Other study done by the Centers for Disease Control and Prevention in million infertile American women about the causes of infertility, monitors the safety and efficacy of infertility treatment and sponsors national prevention programs. They found that management and prevention of infertility need more collaboration of many sectors and agencies. This was similar to our conclusion (Macaluso *et al.*, 2010). A cohort study done in Duhok, Iraq by (Razzak and Wais, 2002) about causes of infertility their result almost similar, except in the percentage of tubal occlusion, it was less in their study. While (Rowe, 1999) study clinical aspects of infertility and the role of health care services, the research carried out since the late 1970s by the Special Program of Research, Development and Research Training in Human Reproduction on clinical aspects of infertility, with an emphasis on developing countries, particularly sub-Saharan Africa, where prevalence has been the highest in recent decades. Their final result was not going with our study.

CONCLUSION

This program will help health authorities to invest in improving information, education and counseling on issues pertaining treatments of infertility and in drawing up guidelines for the management of infertility at all levels of health care.

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