

ORIGINAL RESEARCH ARTICLE

Quarter of a Century of Female Sterilization in Jos, Central Nigeria

Josiah T Mutihir and DD Nyango

Department of Obstetrics and Gynaecology, Jos University Teaching Hospital, Jos, Plateau State, Nigeria

*For correspondence: Email: jtmutihir01@yahoo.co.uk

Abstract

The study was to assess the types and trend of female sterilization between January 1985 and December 2009 (25 years) in Jos, Central Nigeria. There were 25,313 new acceptors of modern contraceptive methods out of which 4,951 (19.6%) were female sterilizations. Minilaparotomy was the commonest method of female sterilization. Local anaesthesia was the commonest anaesthetic utilized. The women were mostly women of relatively older age, grandmultiparous and with large family size. The women were of mean of 38.4 years, and 60% had more than 5 children at the time of sterilization. Interval sterilization constituted 78.5% of the female sterilizations. The acceptance of female sterilization, however, has declined over the years, as acceptance of the long acting contraceptive implants increases. Female sterilization by minilaparotomy under local anaesthesia was found to be feasible, cost effective and acceptable by majority of clients, and recommended for integration into minor gynaecological procedures in our institutions (*Afr J Reprod Health 2011; 15[1]: 101-106*).

Résumé

Quart de siècle de la stérilisation à Jos, Nigéria du centre. L'étude avait pour objectif d'évaluer les types et la fréquence de la stérilisation féminine entre janvier 1985 et décembre 2009 (26 ans) au Centre Universitaire Hospitalier de Jos, Nigéria du centre. Il y avait 25.313 accepteurs nouveaux des méthodes contraceptives modernes dont 4.951 (19,6%) étaient des stérilisations féminines. La méthode la plus commune de la stérilisation féminine était la minilaparotomie. L'anesthésie locale a été l'anesthésie la plus communément utilisée. Les femmes étaient dans la majorité des femmes relativement plus âgées, grandes multipares et qui ont beaucoup d'enfants. Les femmes avaient en moyenne 38,4 ans et 60% avaient plus de cinq enfants le moment de la stérilisation. L'intervalle de stérilisation constituait 78,5% des stérilisations féminines. L'acceptation de la stérilisation féminine, pourtant, devient de moins en moins fréquente au cours des années au fur et à mesure que l'acceptation des implants des contraceptifs à effet prolongé augmente. On a trouvé que la stérilisation féminine à travers la minilaparotomie sous l'anesthésie locale est faisable, rentable et acceptable par la majorité des clientes ; elle est recommandé pour être intégrée dans les procédures secondaires dans nos établissements (*Afr J Reprod Health 2011; 15[1]: 101-106*).

Keywords: Female sterilization, Jos, Quarter century, Nigeria

Introduction

At the international conference on Population and Development in Cairo in 1984, the international community pledged to make universal access to family planning and sexual and reproductive health services a reality by the year 2015. Accessible and effective family planning services may avert up to 35% of maternal deaths.¹

Family planning is one of the 12 pillars of reproductive health. It is an important component of reproductive health and therefore a primary health strategy with important benefits for both maternal and child health. Role of Family Planning helps women to protect themselves from unwanted pregnancies, saves the lives of children by helping to space births, improves family well-being, helps nations to develop and gives everyone a better opportunity for a good life.

Family planning is for couples all over the world, especially in developing countries where the fertility rate and maternal mortality ratio are unacceptably high. Many methods are now available, including female sterilization, and thus significantly increasing the number of options available to desiring clients, and increasing the ability of the health care provider to meet the specific needs of a larger number of contraceptive users at less risk of harmful side effects.²

Female sterilization is a permanent, safe and effective method of contraception. It entails a surgical procedure, offered by a trained health care provider under some form of anaesthesia. The procedure is achieved through various methods of approach to the fallopian tubes, namely laparotomy, culdotomy, culdoscopy, laparoscopy, and minilaparotomy using different anaesthetic techniques. The aims of anaesthesia are to minimize psychological, emotional distress and trauma to patients and free them from pain and discomfort that the

surgical procedure will evoke.³ General anaesthesia, with its attendant known complications, was used predominantly in the earlier times to achieve analgesia and amnesia for the procedure. The drawbacks for this anaesthetic technique were the increased cost, prolonged recovery time, and anaesthetic related complications including death.⁴ A woman could choose to be sterilized coincident with caesarean section.⁵ This has the advantage that the abdomen is already opened for the caesarean section, and tubal ligation adds just a few more minutes to the total operating caesarean section time. Caesarean section is performed under general or spinal anaesthesia. Using local anaesthesia rather than general anaesthesia for minilaparotomy minimizes the major risk of sterilization, that is, the complications of anaesthesia.⁴

Minilaparotomy performed under local anaesthesia, developed in the 1960 has transformed female sterilization into a quick and safe outpatient procedure.^{4,6,7} Over the years, different anaesthetic methods have been used to control pain in this method of contraception in order to make it simpler, safer acceptable, affordable, and as much as possible, an outpatient procedure.

Local anaesthesia, using plain Lignocaine 10-20 ml of 1%, a safer, cheaper and simpler anaesthetic technique and minilaparotomy operative procedure has revolutionized female sterilization with resultant increase in the acceptability of this method of contraception.

The family planning unit of the Jos university teaching hospital is an important source of contraceptive supply, providing contraception to desiring clients in the North-Central part of Nigeria.

The use of family planning services in Nigeria has remained low, despite many efforts to increase access to acceptable quality services. In particular, female sterilization is a highly underused method, despite increasing levels of unmet need for methods to help women and couples limit future childbearing.

The literature on female sterilization in Africa is, as a consequence, limited and little is known about successful approaches to providing this contraceptive method. Jos University Teaching Hospital has been offering female sterilization for over 25 years and is therefore in an excellent position to share experiences with other medical facilities and reproductive health programmes.

The study was therefore designed to identify the methods commonly accepted by the clients and the group of women accepting the various methods of contraception, so as to assist us to plan accordingly for continuous services.

We present our experience of the development of family planning services, particularly female sterilization, in the centre trend of female sterilization in Jos over the last twenty five years, the up-take, acceptor characteristics and recommend it as a cost effective method of permanent contraception in resource poor settings.

Subjects and Methods

The case notes of all female sterilization between 1985 and 2009 were retrieved and analyzed for demographic characteristics, anaesthetic technique, surgical technique and timing of the procedure. The cases of female sterilization included those that had the procedure effected at caesarean section, in the immediate postpartum period and as an interval procedure.

The clients and their spouses were appropriately counselled about the surgical and anaesthetic techniques used for the procedure, and all signed informed consent forms.

The department has a dedicated sub-unit for female sterilization initially sponsored and equipped by Association for Voluntary Surgical contraception (AVSC). This subunit consists of dedicated minilaparotomy theatre, office for counselling and preparation of the clients for surgery, separate records and in addition, dedicated Nurses and attendants to man the sub-unit. Resident doctors of the department do Family Planning postings and each of them has to do at least 10 procedures during the posting to be certified. A trained consultant oversees the sub-unit and coordinates all activities and trainings. The subunit works in close liaison with the main Family Planning section of the department. The records of all the cases were therefore easy to retrieve for analysis. The data was analyzed using the Epi-Info 2002 software package.

Results

A total of 25,313 new clients accepted all forms of modern contraception out of which female sterilization constituted 4,951 (19.6%) of the forms of contraception in the centre during the period of study January 1985 to December 2009. On average, about 198 female sterilizations were performed yearly in the centre. The trend is shown in Figure 1.

The mean (\pm SD) age, parity and number of living children at the time of sterilization of the clients were 38.4 ± 4.8 years, 7.6 ± 2.4 and 6.3 ± 2.4 respectively.

The women were predominantly of low educational status as 81.4% of them had below primary school education and had no occupation to earn an income, Table 1.

Table 1: Distribution of educational status of clients accepting BTL (n = 4,951)

Educational level	Number (%)
Non-literate	3,043 (61.5)
Completed primary	986 (19.9)
Completed secondary	585 (11.8)
Tertiary	243 (4.9)
Not stated	94 (1.9)

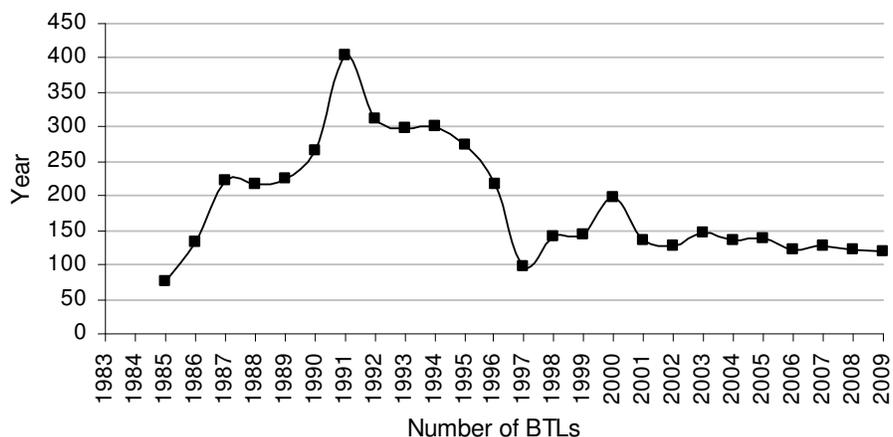


Figure 1: Trend of Acceptance of Female Sterilization over 25 years in Jos (n = 4,951)

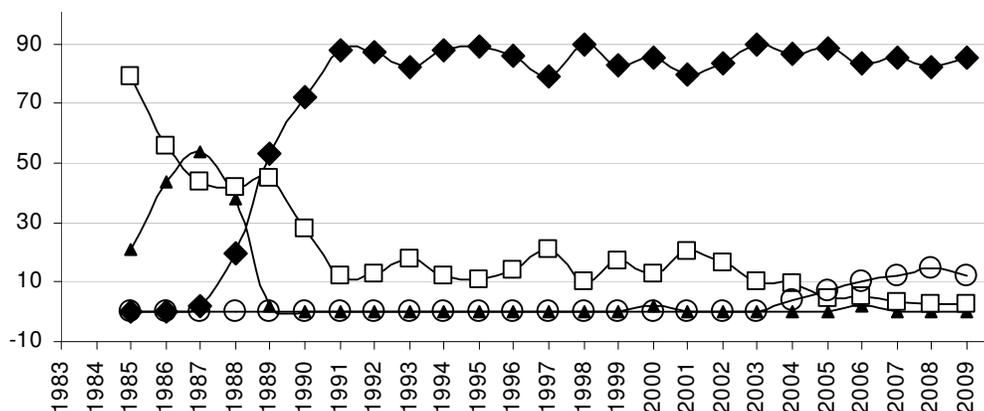


Figure 2: Anaesthetic trend in female sterilization over a 23-year period (♦, LA (%); ▲, LA + sedation (%); □ GA (%); ○ Spinal (%))

The predominant anaesthetic technique was local anaesthesia in 76.1% of the cases, 13.8% general anaesthesia, spinal anaesthesia 2.1%, and 8.0% were local anaesthesia plus mild sedation, (Table 2). The timing of the procedure showed that 78.5% were performed as interval procedures, 15.9% were at caesarean section and 5.6% were in the immediate postpartum period, that is, within 48 hours of vaginal delivery (Table 3).

The relative cost of female sterilization shows that it is cheaper than other methods considering the permanent nature, avoiding revisits and resupply (Table 4).

Table 2: Anaesthetic methods utilized for the procedures (n = 4,951)

Method	Number (%)
Local anaesthesia only	3,767 (76.1)
Local anaesthesia + sedation	398 (8.0)
Spinal anaesthesia	104 (2.1)
General anaesthesia	682 (13.8)

Table 3: Timing of the sterilization procedure (n = 4,951)

Timing	Number (%)
Interval	3,890 (78.5)
At C/S	786 (15.9)
Postpartum	275 (5.6)

Table 4: Comparative costs of commonly used contraceptives in Jos

Contraceptive method	Cost per service in US\$ (Naira)
Implants (Jadelle, Implanon)	13 (2,000)
Bilateral tubal ligation	7 (1,000)
Injectables	0.5 (60)
Intrauterine devices	1.3 (200)
Oral pills	0.1 (15)
Female condom	0.1 (20)
Male condom	< 0.01 (1)

The surgical approach to the fallopian tubes used minilaparotomy in 83.4%, laparotomy in 15.9%, and

laparoscopy in 0.7%. Pomeroy technique of tubal occlusion was the commonest surgical method utilized (97.9%). Others were fimbriectomy in 1.3%, Falope/Yoon ring application in 0.7% and the Filshie clips application in 0.1%.

Figure 2 shows the anaesthetic trend for the female sterilizations over the study period. This demonstrated a dramatic paradigm shift from the use of general anaesthesia for the majority of cases in 1985; local anaesthesia plus sedation in 1988-1989, to local anaesthesia alone from 1990 to 2009. Spinal anaesthesia gradually almost completely replaced general anaesthesia as for caesarean section in the last quarter of the study period and hence for female sterilization during caesarean section.

Discussion

Jos University Teaching Hospital took off as a teaching hospital in 1981 with the four main departments including the Obstetrics and Gynaecology Department. The pioneer head of Department, Dr EA Wright, a graduate of University College Ibadan, where family planning was already grounded, was keenly interested in Family Planning and therefore established a functional unit of Family Planning, providing a wide range of modern family planning methods.

Family Planning services commenced in the early part of 1982 with the then Head of Department, personally supervising the unit. Well motivated nurses/midwives were identified and sent to Ibadan to train in integrated family planning, and family planning counseling which helped in the sound take off of the unit in the department. The unit soon attained the status of a Type – A facility, providing all modern methods of contraception including surgical methods.

At the outset, the Family Planning unit provided only few methods of the modern contraceptive methods including the oral pills, the barrier methods (the male condom), and the injectables. Female sterilization was then only offered to patients for obstetric reasons. These were women with 3-4 previous caesarean sections, ruptured uterus and some medical conditions. These were all performed during caesarean section or laparotomy under general anaesthesia. This continued until 1988 when the Association for Voluntary Surgical Contraception (AVSC), concerned about the method of female sterilization, sponsored a Doctor/Nurse team to Kenya to train in minilaparotomy under local anaesthesia. On return to Jos, this team proceeded to train resident doctors in the department in minilaparotomy under local anaesthesia (ML/LA) and this was soon to be institutionalized in the department as every resident doctor training in the department had to train and be proficient in the art of minilaparotomy.

The AVSC supported trainings by equipping donated space for ML/LA in addition to the provision of all required consumables for the procedure including suture materials. The cost of the procedure was therefore

heavily subsidized making in affordable to all desiring clients. Husbands of clients were encouraged to come with their wives and both signed informed consent after adequate and thorough counselling about the permanence of the method.

In preparation for training periods, the nurse Counsellor went out to surrounding villages on awareness creation and sensitization of women. Interested clients were asked to come to the Family planning unit for counselling and screening for fitness. Women found eligible were recruited for the training. Those found unsuitable or had contraindications to the method were offered other methods of contraception with duly informed choice. This trip was fully sponsored by support from AVSC. During training periods, the procedure was offered to clients completely free of charge as an incentive.

It is interesting to observe here that because the operators were so proficient in the procedure that clients had little or no discomfort during the procedure. This process generated a lot of satisfied clients who themselves began referring other clients to the clinic particularly during training periods.

Counselling of prospective clients for female sterilization actually starts at the antenatal and postnatal clinics. As health talks are given to these patients, the trained Nurse Counsellor also talks on family planning and available contraceptives. They are told where the clinic is located and are invited to see the clinic.

At the family planning clinic, the Nurse Counsellors offer general family planning counselling to all clients in the waiting room. After that, clients are given the opportunity for individual counselling where they can ask questions, clarify issues and make an informed choice of a method.

The department was soon identified by donor agencies as committed to ML/LA and the proficiency with which this was done was amazing. This paved way for the department to attract conduct trainings in minilaparotomy under local anaesthesia. Trainings were then offered to medical practitioners from within and outside Nigeria. Trainings were also offered specifically for counselling for female sterilization because of its permanent nature.

The sub-dermal contraceptive implants were introduced into the contraceptive method mix in 1985. Pre-introductory clinical trial in Nigeria was between 1985 and 1990,^{7,8} and Jos University Teaching Hospital participated in the trial. The implants were introduced into clinical settings in 1989, overlapping with the pre-clinical introductory clinical trial.⁷ Norplant got registered for use in Nigeria with National Agency for Food and Drug Administration and Control (NAFDAC), in 1998, with the registration number of 04-110.⁹

The clients accepting female sterilization were distinct and in a group. They were women of older age (mean age 38.4 ± 4.8 years), higher parity (mean parity 7.6 ± 2.4), higher number of living children (mean of 6.3 ± 2.4), and of little or no significant educational status when compared with acceptors of other forms of

contraception in the same centre.^{10,11} Over 80% of the clients were non-literate and those with completed primary education, and can be said to be women of high fertility, predominantly non-literate and of low socioeconomic status. This is similar to other findings from different parts of the country.¹²⁻¹⁴ This may be due to the high premium placed on large family size in the country. Female sterilization in Jos is skewed towards the less educated women, as majority (61.5%) of them had no formal education. The women of tertiary education constituted only about 5% of the women. The more educated women patronised other modern methods of contraception which were more costly. This however was the reverse in studies in South-Eastern Nigeria¹² and four Latin American Countries.¹⁵

The other attractive features of the female sterilization were the fact that it is cost effective and require no subsequent follow-up visits. Continuity of the method is one hundred percent. Because of the subsidy, female sterilization costs just one thousand naira (about seven US dollars). This is cheaper than the contraceptive implants which are double this cost. The method can therefore said to be affordable to most desiring clients.

Female sterilization is therefore accepted method of contraception in the centre for over a quarter of a century, performing about 198 procedures a year. The acceptance rate of about 20% is high compared with the rate of 1% in south-eastern Nigeria where tubal sterilization remains low.¹²

The period in which the procedures done were highest was between 1987 and 1996. This was the decade when the centre was supported and sponsored to train others in the procedure having trained initially in Kenya to provided safe and effective minilaparotomy under local anaesthesia and as a day-case procedure. Before then, it was offered through laparotomy, under general anaesthesia and patients were on admission for about 7 days.

Female sterilization by minilaparotomy under local anaesthesia was the method of choice in about three quarters of the clients seeking permanent form of contraception in Jos, Nigeria. A gradual shift has been witnessed from the use of general anaesthesia through local anaesthesia plus sedation to the use of local anaesthesia alone for female sterilization particularly for minilaparotomy female sterilization in Jos. The reasons for the shift in anaesthetic technique have principally been for training received in this method, occasioned by the limited resource availability. The choice of anaesthetic regimen in any environment should be guided by cost or affordability, safety and availability, provision of client satisfaction and minimal attendant complications.¹⁶ Studies in the United States have indicated that many women prefer the use of local anaesthesia for sterilization procedures.¹⁵

Female sterilization in the same facility prior to 1986 was performed under general anaesthesia in about 79% of the cases¹⁶ the rest (21%) were performed under local anaesthesia plus heavy sedation. This trend has been

reversed following series of trainings in minilaparotomy under local anaesthesia, over the years. An earlier study in the same unit reported that general anaesthesia accounted for 19%, local anaesthesia plus sedation, 79% and local anaesthesia alone, only 2%.¹⁷

Prior to 1985, the indication for female sterilization was mainly for obstetric reasons, such as repeat caesarean sections, medical disease conditions; and general anaesthesia was then the most commonly used anaesthetic technique. Recently, the indications for female sterilization in the setting have expanded to include 'completed family size'. The timing of the female sterilization influences the surgical approach, the method of tubal occlusion and the anaesthetic technique used. In this study, all female sterilizations during caesarean section and at laparoscopy were performed under general anaesthesia, and lately, spinal anaesthesia. Female sterilization with the laparoscope was performed only in 33 clients in the study, and all were under general anaesthesia. These have since been abandoned for minilaparotomy under local anaesthesia which is safer, cheaper and cost-effective. Offering sterilization during an un-planned or emergency caesarean section is generally considered to be unethical.¹⁶ Multiparous women who had been adequately counselled for sterilization could have the procedure done during the caesarean section. However, caesarean section with the sole aim of performing tubal ligation in patients is no longer practiced in the centre.

The addition of sedation to local anaesthetic to effect female sterilization has almost disappeared from our centre. These medicaments given with the sole aim of relaxing the client, making her more comfortable, increase the potential risk of the overdose of these systemic sedatives, in addition to the cost of the procedure. It has therefore given way to "local anaesthesia alone" as an anaesthetic technique. The use of local anaesthetic techniques has made female sterilization faster, safer, simpler and affordable thereby making more clients to accept the method more readily.¹⁸ General anaesthesia was the method of choice for caesarean section until 2005 when spinal anaesthesia was introduced for caesarean section in the facility. Spinal anaesthesia is now used only in cases of caesarean section where female sterilization is effected as an additional procedure during the caesarean operation. This will probably continue to be the anaesthetic method in these cases where female sterilization is also offered. Anaesthetic choice in this study was influenced mainly by two factors, namely, those performed at the same time with caesarean section and those performed at other times (postpartum following vaginal delivery and interval). Local anaesthesia alone has been shown to be well tolerated by our patients.

The yearly rate of female sterilization appears to be reducing over the years in the centre despite the low cost. This may be because of the availability of longer acting contraceptive methods (implants) whose acceptance rate is constantly rising. Other physicians have also been

trained in the art of safe and effective minilaparotomy under local anaesthesia. The services are therefore provided at these other sites in the town where the trained doctors work. Another possible reason in the decline in the rate is that, organized trainings, where the services are provided free to women are no more conducted in the facility. This means that even the subsidized cost is not affordable to some clients.

Conclusion

Female sterilization has come a long way in Jos, and has provided safe and effective permanent contraception for desiring clients over the quarter of the century. The yearly acceptance rate however, appears to be declining. Eligible clients may be opting for the long acting contraceptive implants. Most female sterilizations can be performed with local anaesthesia. Spinal and general anaesthesia is still recommended for sterilization performed at the time of caesarean section, patients with severe respiratory problems, obesity, and history of multiple previous abdomino-pelvic surgery or pelvic infections. The use of local anaesthesia alone as a method of pain control for female sterilization is recommended for all health facilities in the developing countries including Nigeria. Training, periodic monitoring and evaluation of this technique will ensure improvement in the quality and therefore acceptability of the procedure.

Acknowledgement

We thank the consultants, residents and nurses of the department who also participated in the female sterilizations. We also appreciate the training and material support of Engender Health International, USA.

References

1. Reducing Maternal Death: Evidence and Action, A Strategy for DFID, September 2004.
2. Omigbodun OA. Editorial: Reproductive Health at the turn of the millennium: a glance back. *Trop J Obstet Gynaecol* 2002; 18(1): 2-7.
3. Liskin, L., Rinehart, W., Blackburn, R., Rutledge, AH. Female sterilization by minilaparotomy. *Population Reports. Series C*, 1985; No. 5: 1-5.
4. Liskin L, Rinehart W, Blackburn R, Rutledge AH. Voluntary female sterilization: Number One and Growing. *Population Reports. Series C*, 1990; No. 10: 1-2.
5. International Planned Parenthood Federation. International Medical Advisory Panel (IMAP) Statement on Voluntary Surgical Contraception 1999; 1-3.
6. Liskin L, Rinehart W, Blackburn R, Rutledge AH. Female sterilization: Minilaparotomy and Laparoscopy. *Population Reports. Series C*, 1985; 9: 125-148.
7. Dosumu O. The Institutional Context for Expanding Impact Services in Nigeria. Paper presented at a one-day meeting on Technology Update and Programmatic Review of Implantable Contraceptives, in Abuja, Nigeria, 25th April 2002.
8. The future of Contraceptive Implants in Nigeria. EngenderHealth, Activity Brief: Nigeria. April 2002.
9. Eniojukan JF. Drug administration/registration: Norplant/Jadelle Update. Paper presented at a one-day meeting on Technology Update and Programmatic Review of Implantable Contraceptives; in Abuja, Nigeria, 25th April 2002.
10. Mutihir JT, Pam VC. Overview of Contraceptive use in Jos University Teaching hospital, north Central Nigeria. *Nig J Clin Pract* 2008, 11(2): 139-142.
11. Mutihir JT, Nyango DD. One year with Implanon subdermal implants in Jos, Nigeria. *Nig J Clin Pract* 2010; 13(1): 28-31.
12. Nwogu-Ikojo EE, Ezegwui HU, Nweze SO. Sterilization by Minilaparotomy in South-Eastern Nigeria. *Afri J Reprod Health* 2009; 13(4): 105-111.
13. Aisien AO, Ujah IAO, Mutihir JT, Guful F. Fourteen years experience in Voluntary female sterilization through minilaparotomy in Jos Nigeria. *Contraception* 1999; 60: 249-252.
14. Omu AE, Akagbosu F. Voluntary Surgical Contraception: Attitude, Knowledge and Practice. *Trop J Obstet Gynaecol*, 1999; 20(Special Edition): 22-26.
15. Leite IC, Gupta N, Rodrigues RN. Female sterilization in Latin America: Cross-national Perspectives *J Biosoc Sci* 2004; 36: 683-698.
16. Ujah IAO, Mutihir JT. Pain control in Voluntary surgical Contraception. *East Afr Med J* 1998; 75(3): 137-139.
17. Aisien AO, Olarewaju RS, Ujah IAO, Mutihir JT, Sagay AS. Anaesthesia for minilaparotomy female sterilization in JUTH, Nigeria: A fourteen-year review. *Afr J Med Sci* 2001; 30: 119-121.
18. Otubu JAM, Towobola OA, Aisien AO, Da'or R, Uguru VE. Female sterilization by minilaparotomy: The Jos University Teaching Hospital Experience. *Trop. J. Obstet. Gynaecol* 1990; 21(Special Edition): 26-28.