

## An Audit of Vaginal Hysterectomies at the University College Hospital, Ibadan

Bello FA (FWACS, FMCOG), Olayemi O (FWACS, FMCOG), Odukogbe AA (FWACS, FMCOG)

Department of Obstetrics and Gynaecology, University of Ibadan, Ibadan, Nigeria.

### ABSTRACT

**BACKGROUND:** Cost reduction, less postoperative morbidity and absence of abdominal scars are advantages of vaginal hysterectomy. The study aimed to examine the rate, indications, and complications of vaginal hysterectomies performed at University College Hospital Ibadan to derive lessons for the immediate future.

**METHODS:** An analysis of the records of all vaginal hysterectomies performed from 1995-2004. Information on the patients' epidemiological characteristics, indications and details of surgery performed, length of duration of surgery and post-operative course was retrieved. Data was analyzed with Stata-11 software.

**RESULTS:** Vaginal: abdominal hysterectomy ratio was 1:9, the former constituting 2.3% of major gynaecological operations done. The mean age of patients was 56.6±12.9 years and most were grandmultiparous. Twenty-two cases (81.8%) were due to genital prolapse. No uteri were larger than 12 weeks' size. Most (78.1%) were performed by consultants. Complication rate was 63.0%; the most frequent was intra-operative haemorrhage. Mean hospital stay was 7.4±3.5 days. Post-operation anaemia was associated with longer hospital stay ( $p=0.02$ ).

**CONCLUSION:** With increasing detection rate of CIN, lesser parities and the availability of the operating laparoscope at our centre, there is need to widen case selection beyond genital prolapse (in view of known benefits of vaginal hysterectomy) for renewed skill acquisition to reduce the high complication rates and for better training of resident doctors.

**KEY WORDS:** Vaginal hysterectomy, genital prolapse, Ibadan

**SHORT RUNNING TITLE:** Vaginal hysterectomy at Ibadan.

### INTRODUCTION

Hysterectomy is one of the commonest major gynaecological operations<sup>1</sup>. Over 575,000 are performed yearly in the United States<sup>1</sup>, most for benign diseases. They constitute 11-16% of major gynaecological surgeries in Nigeria<sup>2-4</sup>. The traditional route is abdominal; however the vaginal route has been widely advocated as preferred because of various advantages to the patient, including less cost and reduced post-operative morbidity<sup>5,6</sup>. Often, a hysterectomy which should be done vaginally is done

abdominally merely because this has become a routine procedure in that particular clinic<sup>7,8</sup>.

Whilst the main indication for vaginal hysterectomy is treatment for genital prolapse, it can be an alternative to abdominal hysterectomy for several other conditions<sup>9,10</sup>, namely, dysfunctional uterine bleeding, adenomyosis, fibroids, cervical polyps, cervical intra-epithelial neoplasia, and even endometrial malignancy in a patient unfit for abdominal surgery<sup>8</sup>. The ease and convenience by which a hysterectomy can be performed through a wide open abdominal incision, have led to a large number of uteri being removed abdominally, and form a hindrance to acquiring the necessary surgical expertise required for vaginal hysterectomy<sup>8</sup>. This is often justified by a belief that the vaginal route should be avoided in the absence of uterine descent or visible prolapse.

There are, relative contraindications to vaginal hysterectomy, which include: a uterus more than 12 weeks' size, uterine immobility, limited vaginal space, adnexal pathology, previous vesicovaginal fistula repair, a cervix that is flush with the vagina, and invasive cancer of the cervix<sup>7,8</sup>. However, uteri up to 20 weeks' size have been removed vaginally, assisted by bisection or morcellation<sup>8,11</sup>. Some authors have reported hysterectomy without such assistance for larger uteri<sup>12</sup>.

A need for hysterectomy and absence of any contraindication to the vaginal route is sufficient indication to perform a vaginal hysterectomy<sup>10</sup>. An examination under anaesthesia, just before the procedure can remove doubt about uterine mobility, even in nulliparous women, thus increasing opportunity for a vaginal approach<sup>8,10</sup>.

Literature widely supports vaginal hysterectomy due to its lesser cost, shorter operative time, reduced post-operative morbidity (including absence of a painful abdominal scar), shorter hospital stay and invariably earlier return to work and normal activity<sup>2,5,6,13,14</sup>. However, there is a vast difference between precept and practice. The ratio of abdominal to vaginal hysterectomy in the United States is approximately 4:1<sup>8,15</sup>; it is recommended that this ratio should be reversed<sup>8</sup>. The ratio in Nigeria ranges from 4:1 in Gombe<sup>2</sup>, Nnewi<sup>3</sup> and Benin<sup>4</sup> to 9:1 in Jos<sup>16</sup>.

A study has suggested that the vaginal route may not be as technically easy for indications other than prolapse in Nigerians, as it is in Caucasians, because of the severe pelvic adhesions often seen in Nigerian women<sup>17</sup>, which probably partially explains the relative rarity of the procedure. These adhesions are likely as a result of high frequency of pelvic infection in sub-Saharan Africa sexually-transmitted (these places have a higher incidence of genital tract infections), post-abortal (most of these countries have restrictive abortion laws that drive seekers to unsafe abortions) and puerperal (following prolonged labour, as well as out-of-hospital deliveries under unhygienic conditions) infections<sup>18</sup>.

Laparoscopically-assisted vaginal hysterectomy has evolved from the first one in 1988 (actually a total laparoscopic hysterectomy in which the entire operation was performed through a laparoscope with removal of the uterus through the vaginal vault<sup>19</sup>), to laparoscopic approach to the upper pedicles, and adnexectomy or adhesiolysis if required<sup>20</sup>. These have resulted in many hysterectomies that would otherwise have been abdominal being done vaginally. Its advantages over total abdominal hysterectomy include less operative blood loss, less post-operative morbidity, shorter hospital stay and quicker return to normal activity<sup>5,21,22</sup>. Of course, the drawbacks to this in Nigeria would be the greater cost and the relative unavailability of equipment, as well as the greater incidence of pelvic adhesions and much bigger uterine fibroids. In view of the overwhelming argument in favour of vaginal hysterectomy, the gynaecologist should consider it first, only resorting to an abdominal approach when the former is contraindicated.

Recent trends in the practice at University College Hospital (UCH), Ibadan are affecting the indications for and performance of vaginal hysterectomy. First, there is increasing awareness of cervical cancer screening services in the last decade<sup>23</sup>, with expected increasing detection of cervical intra-epithelial neoplasia. Hysterectomy in these younger patients can be safely done through the vaginal route. Secondly, laparoscopically-assisted vaginal hysterectomy has just recently been introduced with expected changes in the pattern of indications, methodology, cost, postoperative stay and complications<sup>5,21,22</sup>. Thirdly, vaginal prolapse, which was the main indication for vaginal hysterectomy may become less common with decreasing parities<sup>24</sup> and the trend of more patients being delivered by skilled attendants, as suggested by the Demographic and Health Surveys<sup>25-26</sup>.

At this transitional period of UCH's gynaecological surgical practice, this descriptive study aims to

determine the indications for, the rate of and the complications associated with vaginal hysterectomy at the hospital. It will examine the period before the upsurge in cervical cancer screening and the introduction of operative laparoscopy at UCH; and thereby attempt to derive lessons for the immediate future.

## MATERIALS AND METHODS

This is a retrospective study of all the vaginal hysterectomies performed at UCH, Ibadan in south-western Nigeria over a ten-year period between January 1<sup>st</sup> 1995 and December 31<sup>st</sup> 2004. The total number of gynaecological admissions and major gynaecological operations were recorded from the ward and theatre registers respectively, to determine the proportion that vaginal hysterectomy constituted. The hospital numbers of patients that had vaginal hysterectomy were retrieved and their medical records reviewed for information on the patients' epidemiological characteristics, their associated medical illnesses, indications for surgery and details of surgery performed, the class of the surgeon (consultant, senior registrar or registrar), length of duration of surgery, post-operative course and the length of post-operative admission. Follow-up visits were also reviewed for post-operative complications.

At UCH, operative blood loss is routinely assessed by the anaesthetist, based on the amount of blood in the suction machine's reservoir and an assessment of the drapes and surgical mops. This is what is usually recorded in the operation notes and was used for the study. All patients for major surgery are required to procure two pints of blood in anticipation of possible intra-operative transfusion requirements. Significant intra-operative haemorrhage was defined as blood loss greater than 500mls.

## ETHICS

The data were entered into a spreadsheet using serial numbers, rather than identifying data about the patients; thus their privacy was protected. Their autonomy was not affected as it was a retrospective audit of records, so their participation did not influence their management.

## STATISTICS

Explanatory variables included patients' demographic characteristics, their associated medical illnesses and length of duration of surgery. The outcome variables were post-operative complications and the length of post-operative admission. Chi-square with Fisher's exact test for categorical variables and students' t-test for continuous variables were performed with STATA-11 statistical software. Significant *p* was set at <0.05 and means were expressed as  $\pm$  SD.

## RESULTS

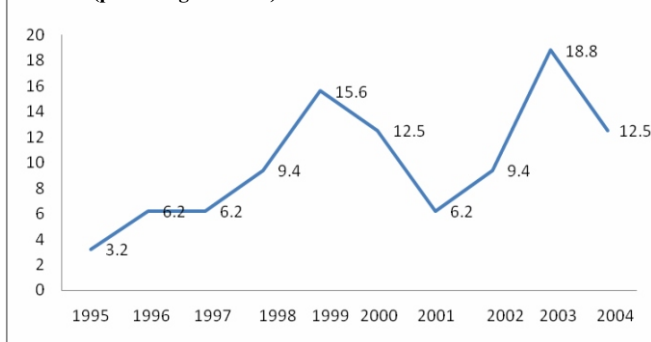
During the ten-year period, there were 313 hysterectomies out of a total of 1381 major gynaecological operations. Two hundred and eighty-one were abdominal and 32 were vaginal, giving a ratio of 9:1. Vaginal hysterectomies thus constituted 2.3% of major gynaecological operations done and 10.2% of hysterectomies. There were 3471 gynaecological admissions over the same period, making admissions for vaginal hysterectomy 0.9% of all admissions. Of these, 27 (84.4%) case notes were available for review.

**Table 1: Demographic data of subjects**

	No (%)
<b>Age (years)</b>	
<40	3 (11.1)
40-49	9 (33.3)
50-59	4 (14.8)
60-69	8 (29.7)
e70	3 (11.1)
<b>Parity</b>	
0	0 (0)
1	0 (0)
2-4	4 (16.7)
e5	23 (83.3)
	27

Table 1 shows the demographic data of the patients. The mean age of subjects was  $56.6 \pm 12.9$  years. All the patients were multiparous; the modal parity being five and six (27.8% each). Fifteen (55.6%) of the women had pre-existing medical illnesses: hypertension in 10 (37%), diabetes mellitus in three (11.1%), ischaemic heart disease in four (14.8%), and chronic obstructive airway disease in two (7.4%): four women had two separate illnesses each.

**Figure 1: Annual frequency of vaginal hysterectomy (percentages shown)**



About three vaginal hysterectomies were done per year during the period of study. More of the cases were done in the latter half of the study period (Figure 1). Of the 27 records analyzed, 22 (81.8%) hysterectomies were done on account of varying degrees of genital prolapse. Only one (3.7%) was done on account of uterine fibroids and the uterine size was 8 weeks in that case. Three were done on account of cervical intraepithelial neoplasia (11.1%) and one for dysfunctional uterine bleeding. Most uteruses were normal-sized; the largest was 12 weeks' size. Twenty-five (78.1%) of the operations were performed by consultants while the other five (21.9%) were performed by senior registrars. None were performed by registrars. In addition to hysterectomy, 23 (74.9%) had varying degrees of pelvic floor repair. Two (6.3%) patients had unilateral oophorectomy and six (18.8%) had bilateral oophorectomy. The duration of surgery ranged from 75-120 minutes with a mean of  $98.9 \pm 15.2$  minutes. Twenty (74.1%) of the patients lost  $\leq 500$  ml of blood during surgery, while seven (25.9%) lost more than this. Two of them were transfused intra-operatively. The mean blood loss was  $547.2 \pm 442.7$  mls.

**Table 2: Complications affecting vaginal hysterectomy during the study period**

Complications	No (%)*
Intra-operative haemorrhage	7 (25.9)
Post-operative haemorrhage	3 (11.1)
Neuropraxia	3 (11.1)
Vaginitis	6 (22.2)
Anaemia (<30%)	6 (22.2)
Urinary tract infection	3 (11.1)
Vault prolapse	4 (16.7)
Dyspareunia	1 (3.7)
Stress incontinence	2 (7.4)
<b>Total</b>	<b>28*</b>

\*Seventeen (not 28) patients had complications; some had more than one. Percentages, therefore, total more than 100%

Complications associated with the surgery are shown in Table 2. Complications were recorded in 17 of the 27 women whose records were available, giving a complication rate of 63% (some had more than one complication). Notable among these were vaginal vault prolapse in 4 (16.7%) of the patients, 3 of which were diagnosed in the early post-operative period, and the fourth one occurring a year after. There was no mortality amongst the patients. Complications were not predicted by age or duration of surgery (Table 3), or by pre-operative morbidity.

Table 3: Possible predictors of complications amongst study subjects

	Those that had complications	Those that did not have complications	<i>p</i>
Age (years)	51.7	63.3	0.11
Parity	5.9	6.3	0.70
Anaesthesia time (mins)	125.5	127	0.91
Surgery duration (mins)	102.5	103	0.95

All patients were discharged between 3 and 15 days, though most (five; 27.8%) were discharged on the 6<sup>th</sup> post-operative day. The mean hospital stay was  $7.4 \pm 3.5$  days. Post-operation hospital admission was significantly longer in patients that had diabetes mellitus ( $p=0.01$ ) and those that developed post-operative anaemia and vault prolapse ( $p=0.02$ ), as shown in Table 4.

Table 4: Effects of pre-existing morbidity and new complications on length of hospital stay

		Mean post-operation admission (days)	<i>p</i>
<b><i>Pre-existing morbidity</i></b>			
Hypertension	Presence	7.4	0.99
	Absence	7.4	
Diabetes mellitus	Presence	13.0	<b>0.01</b>
	Absence	6.8	
Ischaemic heart disease	Presence	5.3	0.26
	Absence	7.9	
<b><i>Complications</i></b>			
Any complications	Presence	8.1	0.20
	Absence	6.0	
Anaemia	Presence	10.3	<b>0.02</b>
	Absence	6.3	
Urinary tract infections	Presence	8.5	0.47
	Absence	6.8	
Vaginitis	Presence	6.3	0.58
	Absence	7.2	
Vault prolapse	Presence	10.3	<b>0.02</b>
	Absence	6.3	
Neuropraxia	Presence	6.0	0.63
	Absence	7.1	

## DISCUSSION

The ratio of abdominal to vaginal hysterectomy of 9:1 in UCH, Ibadan is much greater than the suggested ratio of 1:4<sup>8</sup>. A study done at the same centre, 30 years before this, reported 61 cases of vaginal hysterectomy for uterine prolapse over a 5-year period<sup>27</sup>. This implies they were at least four times more frequently performed and probably more, if those done for other indications were documented. It is not obvious why this gross decline occurred, but lack of skills from loss of practice and training are expected sequelae. Possibilities include the frequent disruptions in hospital services and the increase in the number of specialist hospitals (thus reducing the number of patients) in the region during the study period.

The fact that almost 80% of them were done by consultants would allow even fewer to be available for residents to train with; a similar trend to studies reported from other tertiary training centres in Nigeria<sup>3,4,16</sup>. The increasing number being done in the latter half of our study period is however noted, suggesting that the procedure is more frequently being done now. With the changes mentioned earlier about increasing detection rates of CIN and lesser parities and the availability of the operating laparoscope, there is need for renewed and better-structured training of the residents in performing vaginal hysterectomy.

The distribution of indications shows that vaginal hysterectomy in this centre was still viewed as surgery

mainly for prolapse, similar to findings from other Nigerian centres<sup>3,4,16</sup>. The fact that none were done for nulliparous women may be partly due to the anticipation of lack of mobility and descent of uteri in these women. But, as discussed, an examination under anaesthesia just before surgery may have shown them to be suitable<sup>8</sup>. A study carried out in a UK hospital in which a deliberate decision to perform all suitable hysterectomies through the vaginal route observed a change in the ratio of abdominal:vaginal from about 3:2 to 1:19 after five years<sup>7</sup>. The authors concluded that the attitude of the surgeon, rather than the clinical situation, was a major determinant in the performance of vaginal hysterectomy. Another study involved performance of vaginal hysterectomies (plus adnexectomy, when indicated) in situations where this route is usually considered contraindicated, to evaluate its feasibility and complication rates<sup>28</sup>. The vaginal route was successfully used in 97% of these cases, and laparoscopy was done to complete a few in which it was difficult to mobilize the uterus or access the ovaries. Only 0.98% required conversion to laparotomy. This may proffer lessons for our centre, as the opportunity to resort to laparoscopic surgery (and avoid a laparotomy) may increase confidence in selecting cases for vaginal hysterectomy.

Only about a fifth of our patients had oophorectomy, despite the fact that most patients were above fifty years old and presumably menopausal. As was generally practiced at the time, such women who had hysterectomy for benign disease at our centre were usually counselled for oophorectomy (as prophylaxis against ovarian cancer)<sup>29</sup>. It is technically more difficult to remove ovaries vaginally and there is no place for "risky surgical acrobatics" and only if transvaginal oophorectomy or salpingo-oophorectomy can be performed safely and under vision, should it be done<sup>30</sup>. This was probably the reason it was not done in most cases, and may account for the few cases where unilateral oophorectomy was done. In the UK study cited earlier, by the fifth year of the study when expertise had developed, most associated oophorectomies were performed through the vaginal route<sup>7</sup>. Other workers have also reported good success rates<sup>28,31</sup>.

The commonest additional surgery done was pelvic floor repair. A centre in south-eastern Nigeria<sup>32</sup> reported that all their vaginal hysterectomies were accompanied by anterior colporrhaphy again pointing to the fact that the main indication in Nigeria is limited to genital prolapse.

The complication rate determined in this study was 63%, which has not differed significantly from 63.9% reported over 30 years ago<sup>27</sup>. This, however, was appallingly high in comparison with the rate of 0.26%

reported elsewhere<sup>8</sup>. Possible predictors such as age and pre-existing morbidity were not significantly associated with complications, so one might assume these were due to lack of skills. The commonest complication encountered in this study was intra-operative haemorrhage. This would have led to post-operative anaemia, which was significantly associated with prolonged length of stay in hospital which reduced the ability of the procedure to meet the expectation of shorter stay. Blood loss is expected to be less in vaginal than in abdominal hysterectomy (it cannot be concluded, however, that the reverse is the case here, as blood loss from abdominal hysterectomies at our centre was not analysed). The significant associations derived in this study must be interpreted with caution, however, as it was limited by the small size; which made it unsuitable for multivariate analysis to control for confounders.

Urinary tract infection has been documented as a common complication of vaginal hysterectomy, as surgery acutely impairs urinary drainage<sup>33</sup>. Paradoxically, it has been reported to be worse with indwelling catheterization to enhance the drainage<sup>27,34</sup>. Adeleye and Osinusi reported a rate of 29.5% (proven by positive urine culture) in Ibadan<sup>27</sup>. Only 2 (7.4%) of the patients in our study had urinary tract infection, even though they were all routinely catheterized. They all, however, had antibiotics throughout the same period. Vault prolapse occurred in 11.1% in this study, mostly within days of the surgery. This probably means that the pelvic floor repair was ineffective in those cases and that the technique needs improvement. The absence of mortality in this study is consistent with other work, which reported rates of less than 0.1%<sup>8</sup>, reiterating the relative safety of vaginal hysterectomy.

In conclusion, vaginal hysterectomy was infrequently performed and most cases were on account of genital prolapse. The complication rate was high, the commonest one being intra-operative haemorrhage. In view of the known advantages of this surgical route to the patient, a concerted effort should be made to perform more vaginal hysterectomies, so that skills can be perfected, competence increased, complication rates reduced, and resident doctors will have more procedures to perform and be trained with.

## REFERENCES

1. Farquhar CM, Steiner CA. Hysterectomy rates in the United States 1990-1997. *Obstet Gynecol* 2002; 99: 229-234.
2. Bukar M, Audu B, Yahaya U. Hysterectomy for Benign Gynaecological conditions at Gombe, North Eastern Nigeria. *Nigerian Medical Journal* 2010; 51(1&2): 35-38.
3. Obiechina NJ, Ugboaja JO, Onyegbule OA, Eleje

- GU. Vaginal hysterectomy in a Nigerian tertiary health facility. *Niger J Med*. 2010;19(3):324-5.
4. Abe E, Omo-Aghoja LO. A decade of hysterectomy in a tertiary hospital in urban Niger-Delta region of Nigeria. *Niger J Clin Pract*. 2008;11(4): 359-63.
  5. Harris MB, Olive DL. Changing hysterectomy patterns after introduction of laparoscopically-assisted vaginal hysterectomy. *Obstet Gynecol* 1994; 171: 340-343.
  6. Ribeiro SC, Ribeiro RM, Santos NC, Pinotti JA. A randomized study of total abdominal, vaginal laparoscopic hysterectomy. *Int J Gynecol Obstet* 2003; 83: 37-43.
  7. Varma R, Tahseen S, Lokugamage AU, Kunde D. Vaginal route as the norm when planning hysterectomy for benign conditions: change in practice. *Obstet Gynecol* 2001; 97(4): 613-6.
  8. Sheth SS. Vaginal hysterectomy. In: Studd J, Ed. *Progress in Obstetrics and Gynaecology*. Edinburgh: Churchill Livingstone 1993; 10: 317-340.
  9. Feroze RM. Vaginal hysterectomy and radical hysterocolpomy. In: Monaghan JM, Ed. *Bonney's Gynaecological Surgery (9<sup>th</sup> Ed)*. London, Bailliere Tindall 1986: 60-73.
  10. Sheth SS. Vaginal hysterectomy. *Best Pract Res Clin Obstet Gynaecol* 2005; 19: 307-332.
  11. Hoffman MS, DeCesare S, Kalter C. Abdominal hysterectomy vs. transvaginal morcellation for the removal of enlarged uteri. *Am J Obstet Gynecol* 1994; 17: 309-313.
  12. Harmanli OH, Byun S, Dandolu V, Gaughan JP, Grody MH. Vaginal Hysterectomy for the Enlarged Uterus. *Gynecol Obstet Invest* 2005; 61: 4-8.
  13. Dicker RC, Greenspan JR, Strauss LT, et al. Complications of abdominal and vaginal hysterectomy among women of reproductive of reproductive age in the United States. *Am J Obstet Gynecol* 1982; 144: 841-848.
  14. Abasiattai AM, Basse EA, Umoyoho AJ. Elective Hysterectomy at the University of Uyo Teaching Hospital: A 3-Year Review. *Nigerian Hospital Practice* 2009; 4(1&2): 8-11.
  15. Arbogast JD, Welch RA, Riza ED, Ricaurte EL, Pieper DR. LAVH appears to be an alternative to TAH. *J Laparoendosc Surg* 1994; 4: 185-190.
  16. Ocheke AN, Ekwempu CC, Musa J. Underutilization of Vaginal Hysterectomy and its Impact on Residency Training. *West Afr J Med* 2009; 28(5): 323-326.
  17. Onah HE, Ezegwui HU. Increasing the use of the vaginal route for hysterectomy in Nigerians: a critical appraisal. *J Coll Med* 2002; 7: 13-15.
  18. Okonofua, FE. Infertility in Sub-Saharan Africa. In: *Contemporary Obstetrics and Gynaecology for Developing Countries*, Okonofua F and Odunsi L (eds.) Women's Health and Action Research Centre 2003, 128-156.
  19. Reich H, DeCaprio J, McGlynn F. Laparoscopic hysterectomy. *J Gynecol Surg* 1989; 5: 213-217.
  20. Kovak SR, Cruikshank SH, Retto HF. Laparoscopy-assisted vaginal hysterectomy. *J Gynecol Surg* 1990; 6: 185-190.
  21. Chang WC, Huang SC, Sheu BC, et al. Transvaginal hysterectomy or laparoscopically assisted vaginal hysterectomy for nonprolapsed uteri. *Obstet Gynecol* 2005; 106: 321-326.
  22. Parkar RB, Thagana NG, Otieno G. Laparoscopic assisted vaginal hysterectomy for benign uterine pathology: is it time to change? *East Afr Med J* 2004; 81: 261-266.
  23. Ezem BU. Awareness and uptake of cervical cancer screening in Owerri, South-Eastern Nigeria. *Ann Afr Med* 2007; 6: 94-98.
  24. Odukogbe AA, Adewole IF, Ojengbede OA et al. Grandmultiparity trends and complications: a study in two hospital settings. *J Obstet Gynaecol* 2001; 21: 361-367.
  25. Federal Office of Statistics [Lagos, Nigeria] and IRD/Macro International Inc [Columbia, Maryland, USA]. 1992. *Nigeria Demographic and Health Survey 1990*. Lagos, Nigeria: Federal Office of Statistics and IRD/Macro.
  26. National Population Commission (NPC) [Nigeria] and ICF Macro. 2009. *Nigeria Demographic and Health Survey 2008*. Abuja, Nigeria: National Population Commission and ICF Macro.
  27. Adeleye JA, Osinusi BO. Post-operative morbidity associated with repair operations for utero-vaginal prolapse in Ibadan. *Nig Med J* 1976; 7: 292-294.
  28. Paparella P, Sizzi O, Rossetti A, De Benedittis F, Paparella R. Vaginal hysterectomy in generally considered contraindications to vaginal surgery. *Arch Gynecol Obstet*. 2004;270(2):104-9.
  29. Hickey M, Ambekar M, Hammond I. Should the ovaries be removed or retained at the time of hysterectomy for benign disease? *Hum Reprod Update* 2010;16(2):131-41.
  30. Nichols DH. Update on surgery. *Contemp J Obstet Gynaecol* 1987; 29: 92-109.
  31. Sheth SS. The place of oophorectomy at vaginal hysterectomy. *Br J Obstet Gynaecol* 1991; 98: 662-666.
  32. Onah HE, Ugonna MC. An Audit of Vaginal Hysterectomies in Enugu, Nigeria. *Trop J Obstet Gynaecol* 2004; 21: 58-60.
  33. McDonald PJ, Sanders R, Turnidge J et al. Optimal duration of cefotaxime prophylaxis in abdominal and vaginal hysterectomy. *Drugs* 1988;35 Suppl 2: 216-220.
  34. Summitt RL Jr., Stovall TG, Bran DF. Prospective comparison of indwelling bladder catheter drainage versus no catheter after vaginal hysterectomy. *Am J Obstet Gynecol*. 1994;170(6):1815-8; discussion 1818-21.