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A. T. Lassey, FRCOG, FWACS, Senior Lecturer, R.M.K. Adanu, MBChB, FWACS, Lecturer, Department of Obstetrics and Gynaecology, Korle-Bu Teaching Hospital, M.J. Newman, MBChB, MSc, FWACP, Professor and Head, Department of Microbiology and J.A. Opintah, BSc, Biol Sc Principal Research Assistant, Department of Microbiology, Korle-Bu Teaching Hospital, Ghana

Request for reprints to: Dr. A. T. Lassey, Department of Obstetrics and Gynaecology, University of Ghana Medical School, P.O. Box GP 4236, Accra, Ghana

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A. T. LASSEY, R. M. K., ADANU, M. J. NEWMAN and J. A. OPINTAH

ABSTRACT

Objectives: **To determine the carriage rates of potential pathogens in the lower genital tract and factors associated with colonization among women with incomplete abortion.**
Design: **A cross-sectional study.**
Setting: **The Manual Vacuum Aspiration room of the Korle-Bu Teaching Hospital, Accra, Ghana.**
Subjects: **Two hundred women undergoing Manual Vacuum Aspiration at the Korle-Bu Teaching Hospital.**
Methods: **Eligible patients were screened for the presence of organisms in the lower genital tract by microscopy and culture of high vaginal and endocervical swabs.**
Results: **Nearly two-thirds of the patients (64.2%) had potential pathogens in the lower genital tract. Bacterial vaginosis alone was present in 47% and a combination of bacterial vaginosis and *Candida albicans* was present in 17.2%. Residence in an urban slum showed a significant association with the presence of potential pathogens (Odds ratio 2.6; p-value 0.04).**
Conclusion: **Organisms responsible for bacterial vaginosis were the most frequently isolated potential pathogens in the cervical canal of patients with incomplete abortion at the Korle-Bu Teaching Hospital. Management of these patients should therefore include antibiotic prophylaxis against bacterial vaginosis.**

INTRODUCTION

Post-abortion pelvic inflammatory disease (PID) is a recognised complication of abortion especially termination of pregnancy (TOP). It is associated with short-term morbidity such as septic abortion, septicaemia and pelvic peritonitis and long-term sequelae in the form of tubal infertility, chronic pelvic pain and ectopic pregnancy(1). In the UK, reported rates of post-abortion PID (variously defined) range from 5% to 10%(2). Risk factors for post-abortion PID include the presence of potential pathogens in the lower genital tract at the time of abortion. Infection by several organisms has been implicated in post-abortion PID. These include *N. gonorrhoeae, C. trachomatis* and bacterial vaginosis(3). Bacterial vaginosis is defined as a condition in which there is overgrowth of anaerobes and other bacteria (which may include *Gardnerella vaginalis*) in the vagina, with a corresponding decrease in the number of lactobacilli(4,5). Previous studies investigating genital tract infection in abortion cases have studied cases of voluntary termination of pregnancy(6-8). These studies have shown the need for prophylactic antibiotics in order to prevent pelvic infection after an induced abortion. Studies on spontaneous abortions have shown that infection plays a role in spontaneous abortion although the value of antibiotics in the prevention of miscarriage is still to be defined(9).

At the KBTH since 1996, the MVA has been the main method by which evacuation of the uterus is achieved. The procedure is usually performed under paracervical block. The aim of the study was to determine the prevalence of potential pathogens in the lower genital tract of women undergoing Manual Vacuum Aspiration (MVA) at the Korle Bu Teaching Hospital (KBTH), Ghana. The socio-demographic characteristics of these women were also assessed.

MATERIALS AND METHODS

From 1st April to 31st August 2001, 200 women admitted to the acute gynaecology wards with incomplete abortion for MVA were recruited into the study after verbal consent. No patient declined to participate in the study and there was none who was too ill to give consent. Cases of incomplete abortion admitted at weekends were not recruited, as logistics for specimen collection as well as processing in the Microbiology Laboratory could not be guaranteed. Patients seen in the hospital at weekends are neither clinically nor

socio-demographically different from those seen on weekdays.

A trained research assistant administered a standardized questionnaire to the patient in the ward before MVA. The questionnaire looked at the age, residence, occupation, educational background, contraceptive use, the history of previous pregnancies and the index pregnancy of the respondents. In cases where the respondent was married, similar relevant information about her partner was obtained. Hospital case notes were used to collect data on gestational age, the attending doctor's assessment of the patient's general condition and the clinical size of the uterus at MVA. At the MVA room a high vaginal swab (HVS) and an endocervical swab (ECS) were taken just before the MVA procedure using a non-lubricated sterile speculum. These specimens were immediately transported in Amies transport medium to the Microbiology Department for processing. Microscopy was done using a Gram-stained vaginal smear, which was assessed for pus cells, normal flora and the appearance of bacterial vaginosis by the criteria of Spiegel *et al*(4). The specimens were cultured on the following plates: Thayer Martin medium (TM), Blood Agar (BA) and Sabouraud Agar (SDA). Plates of SDA were incubated in air at 37°C and other plates were incubated in 5-10% CO_2 (in candle extinction jar) at 37°C and examined at 24hr and 48hr. Isolates were identified by standard techniques(5,10,11). The questionnaires were checked for accuracy and completeness. Two of the 200 questionnaires were excluded from analysis, one because of incomplete data entry and the other because the final diagnosis was changed from incomplete abortion to PID. The data from 198 patients was then coded, recorded and analysed using Epi Info version 6. Two by two tables were used to test for associations and odds ratio calculations were performed. A p-value of 0.05 or less was taken to be significant.

RESULTS

The ages of the 198 respondents ranged from 14 to 43 years. The mean age was 27.7 ± 6.6. The modal age range of the respondents, accounting for 29.3% was 25-29 years (Table 1). A summary of socio-demographic and clinical features is shown in Table 2. Of the 163 recorded responses for contraceptive use, only 10 respondents (6.1%) reported that they had been practicing a modern method of contraception before the index pregnancy. Forty six (23.2%) of the respondents described the index pregnancy as unwanted while 71.2% wanted it and the remaining 11(5.6%) were indifferent.

Table 1

Age distribution of 198 respondents

Age group (years)	No.	(%)
19 and below	23	11.6
20-24	41	20.7
25-29	58	29.3
30-34	41	20.7
35-39	28	14.2
40 and above	7	3.5

Table 2

Characteristics of respondents

Characteristic	No. (total responses)	(%)
Panel a: selected socio-demographtcharacteristics		
Married	153 (185)	77.3
Less than 10 years formal education	38 (57)	64.9
Unskilled worker	130 (185)	65.7
Partner unskilled	69 (160)	43.1
Panel b: Clinical findings		
Clinical feature	No.	(%)
Clinically ill	14	7.1
Clinically anaemic	17	8.6
Uterine size up to 12 weeks	149	72.6
Panel c: Types of abortion		
Type of abortion	No.	(%)
Spontaneous	137	69.2
Induced	52	26.3
Data missing	9	4.5

Table 3

Microscopy and culture results

Micro-organism	No. of specimens	(%)
Bacterial vaginosis	93	47.0
Combined B vaginosis and *C. albicans*	34	17.2
Lactobacillus sp	16	8.1
C. albicans	8	4.0
Staph aureus	3	1.5
No growth	44	22.2

Table 4

Patient characteristics associated with the presence of potential pathogens in lower genital tract

Characteristic	Odds ratio of Positive culture	p-value
Resident in urban slum	2.60	0.04
Partner- unskilled worker	1.40	0.20
Induced abortion	1.30	0.29
Unwanted pregnancy	1.27	0.34
Not married	1.09	0.50
Less than 10 years education	1.50	0.36
On clinical examination	1.02	0.59
Uterus more than 12 weeks size	1.24	0.35
Age less than 20 years	0.69	0.85

The number of previous pregnancies of the respondents ranged from 1 to 12 with a mean of 3.5 ± 2.1 while

their parity ranged from 0 to 9 with a mean of 1.7 ± 1.5. There were 93 cases (47%) of bacterial vaginosis alone and 34 cases (17.2%) of a mixture of both bacterial vaginosis and *C. albicans*. There were eight cases (4.0%) of *C. albicans* alone and 16 cases of *Lactobacillus sp.* There were also three cases (1.5%) of *Staphylococcus aureus. N. gonorrhoea* was not isolated from any of the patients (Table 3). The results of cross-tabulation between variables and the presence of potential pathogens are found in Table 4. The odds ratio (OR) for growth of organisms on culture for urban slum residence was 2.6. This was the only statistically significant characteristic associated with the presence of potential pathogens.

DISCUSSION

This study on the presence of potential pathogens in the lower genital tract of women undergoing MVA at the KBTH showed that 127(64.2%) of the patients had potential pathogens in the lower genital tract. Bacterial vaginosis alone was present in 47% and a combination of bacterial vaginosis and *Candida albicans* was present in 17.2%. These organisms were considered potential pathogens in the lower genital tract of the patients undergoing MVA. Residence in an urban slum showed a statistically significant association with the presence of potential pathogens (Odds ratio 2.6; p-value 0.04). The presence of *lactobacillus* was considered normal lower genital tract flora. *Staph. aureus* was also considered part of the normal flora since there were very few colonies. The zero prevalence of *N. gonorrhoea* is similar to that reported by earlier studies(3,6).

The carriage rate of bacterial vaginosis alone in this study is much higher (47.0% vs 17.5-29%) than that reported from studies in western countries involving patients seeking voluntary termination of pregnancy(3,6,7) but similar to the reported rate of 48.7% in Kumasi, Ghana, in 1989 among a mixed group of obstetric and gynaecology patients(12). The finding that residence in an urban slum was the only significant association with the presence of potential pathogens is perhaps a reflection of a background of poor hygienic practices and high-risk reproductive health behaviour. There was no significant difference between the subsets of induced and spontaneous abortions regarding the presence of potential pathogens (p=0.29).

It is known that the presence of bacterial vaginosis predisposes to pelvic inflammatory disease(13) and a higher incidence of PID has been reported for the West African sub-region(14). Though sexual transmission of the condition has been long considered, the actual factors that lead to bacterial vaginosis have not been identified(15). This high incidence of PID in our sub-region could be attributed to traditional practices such as douching and the insertion of herbal preparations into the vagina which may interfere unfavourably with the normal flora of the vagina and hence increase the risk of genital tract infection. We however did not investigate the existence of such practices among our respondents since this was not the objective of this study. The findings of this study provide an objective basis for the need and choice of prophylactic antibiotics for cases of incomplete abortion at KBTH where nearly two thirds of the patients (64.2%) had a positive growth of potential pathogens in the lower genital tract. This study was limited by the inability to test for the presence of Chlamydia trachomatis due to non-availability of reagents for testing.

The possibility that socio-cultural practices, environmental factors as well as the abortion milieu itself may account for the high prevalence of bacterial vaginosis needs to be researched. A strong point can also be made for studying the role of practices such as the insertion of herbal preparations into the vagina or the traditional douching vis-a-vis the regional differences in the prevalence of bacterial vaginosis.

To conclude, organisms responsible for bacterial vaginosis are the most frequently isolated potential pathogens in the genital tract of patients undergoing MVA for incomplete abortion at KBTH. Management of these patients should therefore include antibiotic prophylaxis for bacterial vaginosis.

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