Diagnosing Pelvic Inflammatory Disease with Limited Diagnostic Tools in a Region of Ghana

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ABSTRACT

The objective of this study was to describe how pelvic inflammatory disease (PID) is diagnosed in a region with limited technological diagnostic tools. Subsequently, we retrospectively reviewed 208 PID case notes and interviewed 25 clinicians in two regional level and four district hospitals of the Central Region of Ghana. We found out that the clinical diagnosis of PID was frequently based on the features of lower abdominal pain, vaginal discharge, fever, lower abdominal tenderness, cervical motion, and adnexal tenderness. Sexual histories of suspected cases were rarely obtained while menstrual and contraceptive histories were scanty. Fifty-one per cent and two per cent of patients received bimanual and vaginal speculum examinations respectively. Predisposing factors were observed in 23 per cent of patients. There was a notion that poor genital hygiene was a cause of PID. We conclude that the periodic audit of clinical management of PID even in the absence of objective diagnostic tools is essential in identifying issues that could improve case prevention, recognition, and management. (*Afr J Reprod Health* 1999; 3 [1]:88-97)

RÉSUMÉ

Région du Ghana : Diagnostique de la maladie de l'inflammation Pelvienne avec des moyens de diagnostique limités. Le but de cette étude était de décrire la façon dont s'opère le diagnostique de la maladie de l'inflammation du Pelvis (MIP) dans une région où l'on dispose de peu de moyens technologiques de diagnostique. En ce sens, nous avons procédé à l'examen retrospectif de 208 cas de MIP et inteviewé 25 cliniciens dans deux régions du Ghana. Nous avons découvert que le diagnostique de la MIP était souvent basé sur la signalisation de douleur du bas de l'abdomen, sécrétions vaginales, fièvres, tension du bas de l'abdomen, mouvement cervical et fragilité adnexale. Les habitudes sexuelles des cas suspectés étaient rarement obtenues et les information sur leurs cycles menstruels et leur prise de contraception étaient insuffisantes. 51% et 2% des patientes avaient reçu respectivement des examens bimanuelles et des examens du spéculum vaginal. Les facteurs de prédisposition étaient observés chez 23% des patients. Il y avait là la notion qu'une mauvaise hygiène des parties génitales était une cause de la MIP. Nous concluons que l'audit périodique de la prise en charge clinique de la MIP, ce même en l'absence de moyens de diagnostique objectifs, est essentiel dans l'identification des éléments qui pourraient améliorer la prévention, l'identification et le traitement des cas de MIP. (*Rev Afr Santé Reprod* 1999; 3: [1]:88-97)

KEY WORDS: *Pelvic inflammatory disease, diagnosis, Ghana*

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Introduction

Besides prolonged morbidity, the sequelae of pelvic inflammatory disease (PID) such as chronic pelvic pain, ectopic pregnancy, and tubal infertility may threaten the marriage of women in sub-Saharan Africa. The centres for disease control recommend a set of minimum clinical criteria for diagnosing PID based on lower abdominal tenderness, bilateral adnexal tenderness, and cervical motion tenderness.[1] Additional criteria combining clinical, haematological, histopathological, sonographic, or laparoscopic states, increase the specificity of diagnosis but are more costly and often invasive. In industrialised countries, laparoscopy is regarded as the gold standard for the definitive diagnosis of PID. The diagnosis on clinical grounds alone is at best accurate in about 82 per cent of cases,[2] yet, clinical diagnosis remains the usual approach available to clinicians in most developing countries where laparoscopic facilities are unavailable or unaffordable. An audit of diagnostic practices in such settings is essential in identifying patterns of presentation in presumed cases and in identifying diagnostic difficulties, which may be amenable to local intervention. This study describes the characteristics of patients clinically diagnosed with PID in Ghana as well as clinicians' perceptions and practices with respect to this condition.

Methods

We retrospectively examined the case notes of 208 patients with a diagnosis of PID admitted in six hospitals in the Central Region between January and December 1996. These patients' records represented 87 per cent of total PID admissions in the six hospitals in 1996. The hospitals were the regional hospital, a university hospital, two government-owned and two mission-owned district hospitals. The four district hospitals were randomly selected from four government and three mission hospitals in the region. In each hospital, we interviewed clinicians who had managed PID in the preceding six months using a structured questionnaire designed to assess their management practices relating to PID. Findings from the interview were intended to supplement those of retrospective study. A trained research assistant (a medical student) interviewed the clinicians. The design of the questionnaire required clinicians to initially volunteer information on clinical questions, they were then asked about specific case management experiences. The data were analysed using the *Epi Info 6.03* software.[3]

Findings

Demographic characteristics of subjects

The ages of patients with a diagnosis of PID ranged from 15 to 65 years (median 26 years); 64 per cent of the patients were less than 30 years old. Fifty-five patients (26%) were seen at the regional hospital, 18(9%) at the university hospital, 40(19%) at government district hospitals, and 95(46%) at mission district hospitals. A limited number of records addressed the occupation and marital status of patients. Of 111 patients with recorded occupations, 51(46%) were traders, 21(19%) were hairdressers or dressmakers, and 11(10%) were fishmongers. Of 58 patients with stated marital status, 76 per cent were married and 22 per cent were single.

The clinicians comprised 15(60%) senior medical officers or specialists in obstetrics/gynaecology, nine (40%) junior medical officers and one (4%) medical assistant. The majority of clinicians interviewed (88%) had been working in the Central Region for longer than six months.

Symptoms of PID in the Central Region

The commonest symptoms were lower abdominal pain (LAP), fever, and vaginal discharge (Table 1). Six patients complained of both generalised and lower abdominal pain. Clinicians voluntarily confirmed LAP, vaginal discharge, and fever as the most common symptoms of PID of their patients. They further disclosed dysuria, dyspareunia, and irregular

menses as other common symptoms of PID on direct questioning. Backache, vaginal bleeding, and nausea were relatively uncommon.

Table 1: **Symptoms of PID reported among 208 inpatients**

Symptom	Frequency	%
Abdominal pain — lower	195	93.4
— general	16	7.7
Fever	72	34.6
Vaginal discharge	55	26.4
Nausea/vomiting	45	21.6
General malaise	42	20.2
Dysuria	37	17.8
Bleeding per vaginaam	18	8.6
Diarrhoea	17	8.2
Disturbed menses	11	5.3
Backache	10	4.8
Sudden collapse	6	2.9

Predisposing factors for PID

Predisposing factors for PID were identified in 47 patients (23%). These were a previous history of PID in 12 patients (6%), recent delivery (5%), recent termination of pregnancy (post-TOP, 5%), attempted TOP by chemical ingestion or intravaginal herbal insertion (2%), recent spontaneous abortion (post-abortal, 2%), therapeutic evacuation of the uterus (post-EOU, 2%), and insertion of IUCD (post-IUCD, 0.5%). A history of multiple sexual partners, previous sexually transmitted disease (STD), recent hysterosalpingography (HSG), or female circumcision were not recorded.

The clinicians interviewed reported the commonest predisposing factors that they encountered as a history of having multiple sexual partners (68%), poor genital hygiene (36%), recent TOP (23%), and vaginal insertion of herbs or chemicals (18%). They proposed that drying panties by hanging them under wet towels or under beds, cleaning the anal region in a postero-anterior direction after defecation, inadequate genital hygiene during menses, and communal use of sanitary facilities put women at increased risk of PID. Direct questioning confirmed recent TOP and multiple sexual partners and identified history of previous PID, previous STD, and recent spontaneous abortion as common predisposing factors (Table 2). Clinicians infrequently encountered postpartum or post-IUCD PID; they rarely encountered PID following HSG or female circumcision.

Table 2: **Percentage of clinicians reporting frequency of predisposing factors for PID**

Factor	Voluntary (n=22)	On Direct Questioning (n=25)	
		Very Common	Common/Uncommon
Previous PID	0%	84%	12%
Recent TOP	23%	72%	24%
Multiple sexual partners	68%	68%	16%
Previous STD	0%	48%	16%
Recent miscarriage	5%	44%	20%
Postpartum (puerperal)	0%	28%	60%
After IUCD	0%	20%	52%
After hysterosalpingography	0%	0%	40%
Female circumcision	0%	0%	4%

Gynaecological and obstetric history

The gynaecological (menstrual, sexual, and contraceptive) experiences of PID patients were scarcely recorded. The commonest interval between left mentoposterior position (LMP) and the onset of symptoms of PID was reported as less than seven days by 10 (40%) clinicians, between seven and 14 days by 9 (36%) clinicians and more than 14 days by 2 (8%) clinicians; 4(8%) observed no particular pattern.

None of the case notes recorded sexual history. Two patients had been on contraceptives; one on medroxyprogesterone, and the other on an IUCD. Two patients had a history of previous ectopic pregnancy. Data on number of previous pregnancies, abortions, and deliveries were generally scanty.

Prior treatment history

Only three (1%) case notes showed a record of treatment prior to admission for PID. One patient had taken two antibiotics and two had each taken a single antibiotic. The sources of antibiotics were a health centre in two cases and relatives in one case.

Table 3: **Physical findings in patients with a diagnosis of PID**

Sign	No. of Cases	%
Abdomen (n=204)		
Abdominal tenderness	201	98.5%
Guarding	100	49.0%
Area of abdominal tenderness (n=201)		
Lower abdomen, maximum hypogastrium	168	83.6%
Generalised	19	9.5%
Left lower	10	5.0%
Right lower	4	2.0%
Palpable pelvic masses	13	6.4%
Pelvis (n=104)		
Mucopurulent vaginal discharge	72	69.2%
Cervical motion tenderness	71	68.2%
Adnexal tenderness	50	48.1%
Cervical os open	11	10.6%
Bulky or pregnant uterus	11	10.6%
Adnexal masses	7	6.7%
Blood in vagina	6	5.8%
Products of conception present	6	5.8%
Hot vagina	4	3.8%
Mucopurulent cervical discharge	2	1.9%
Retroverted uterus	2	1.9%
Intrauterine contraceptive device	1	1.0%
Reduced uterine mobility	1	1.0%

Relevant signs

Of 145 patients with recorded general condition, 127(88%) were reported to look ill or severely ill. Fifty-five (26%) of the 208 patients had a temperature of more than 38°C on admission. Of 204 patients whose findings were available, 201(99%) had abdominal tenderness. Of these, 168(84%) had maximal abdominal tenderness in the hypogastrium (Table 3). Bimanual pelvic examination was performed on

104 patients (51%), a vaginal speculum being used for four (2%) patients. The proportion of patients receiving vaginal examination (VE) in the six hospitals ranged from 10 per cent in one government district hospital to 90 per cent in one mission district hospital (χ^2=74.3; p<0.001). Seventy-two patients (69%) had a malodorous mucopurulent vaginal discharge and 71 (68%) had cervical motion tenderness.

Almost all clinicians routinely examined patients with suspected PID. The usual duration of examination was less than five minutes (48%) or between five and ten minutes (48%). According to the clinicians, the most helpful signs for the diagnosis of PID in the Central Region were lower abdominal tenderness (96%), vaginal discharge (84%), cervical motion tenderness (72%), adnexal tenderness (60%), and pyrexia (56%). Clinicians reported performing VEs routinely (64%) or selectively (32%) on their patients with suspected PID. Patients selected for VE were those in whom diagnosis was not clear or those with suspected post-abortal or postpartum PID. A vaginal speculum was used routinely by 8 (33%) and selectively by 9 (38%) clinicians. Seven clinicians (29%) never performed a speculum examination (SpE). Reasons for SpE were to take a high vaginal smear (HVS), to visualise the cervical contour, to assess source of discharge, and check for the presence of herbs. Less frequently, SpE was performed in cases of recurrent PID, when there was no vaginal bleeding, when a speculum was available, or when there was enough time. Reasons for not performing a SpE were lack of a speculum and a feeling that digital VE was sufficient for diagnosis.

Investigations requested or performed in the management of PID

Laboratory investigations were requested or performed for 131 patients (63%). Of these, 73 (56%) were for routine urine examination, 54 (41%) for pregnancy tests on urine and 12 (9%) for microscopy and culture of HVS (Table 4). There was no request for endocervical or urethral swab bacteriology.

Table 4: **Laboratory investigations requested or performed in the management of PID**

Investigation	Frequency	%
Urine routine examination	73	
Pregnancy test	54	
Positive	39	72.2%
Negative	15	27.8%
White blood cell count request	43	
Haemoglobin estimation	42	
Blood film for malarial parasites	40	
Positive	6	15.0%
Negative	34	85.0%
Erythrocyte sedimentation rate request	15	
Widal test	13	
Positive	1	7.7%
Negative	12	92.3%
High vaginal smear request	12	
Ultrasonography request	8	
Urine for culture and sensitivity	6	
HIV screening	2	
Negative	2	100.0%
VDRL test	2	
Negative	2	100.0%
Endometrial biopsy	1	

At the interviews, 23 clinicians (92%) reported requesting laboratory investigations for the management of PID. Of these, 21 (91%) requested HVS for microscopy with or without culture and sensitivity, 12 (52%) requested white blood cell (WBC) count, 11 (48%) urine routine examination, 7 (30%) urine culture, and 6 (26%) endocervical swab culture. They suggested HVS microscopy, culture, and sensitivity (56%), endocervical swab microscopy and culture (24%), WBC count (2%), chlamydial cultures (2%), and laparoscopy (2%) as investigations to be performed routinely for the diagnosis of PID in the Central Region. They found HVS, WBC count, endocervical swab, and pregnancy test to be the most useful for the management of PID (Table 5). Three-fifths of clinicians had either found erythrocyte sedimentation rate (ESR) not useful or had never requested it. Laparoscopy and endometrial biopsies were rarely requested.

Table 5: **Clinicians' reports of usefulness of investigations for PID**

Investigation	Very Useful/Useful	Not Useful	Never Requested
High vaginal swab	100.0%	0.0%	0.0%
White cell count	82.6%	4.3%	13.0%
Endocervical swab	73.9%	4.3%	21.7%
Pregnancy test	65.2%	30.4%	4.3%
Urethral swab	56.5%	13.0%	30.4%
Ultrasound examination	52.2%	4.3%	43.5%
HIV screening	52.2%	8.7%	39.1%
Erythrocyte sedimentation rate	39.1%	30.4%	30.4%
Laparoscopy	8.6%	0.0%	91.3%
Endometrial biopsy	4.3%	13.0%	82.6%

N = 23 clinicians

Differential diagnosis and complications of PID

Differential diagnoses were reported in 55 cases (26%). They included ectopic pregnancy (11%), septic abortion (3%), degenerating fibroid (3%), appendicitis (2%), and cystitis (2%). In the clinicians' survey, the most important differential diagnoses were ectopic pregnancy, cystitis/urinary tract infection (UTI), and appendicitis. Twenty-two patients (11%) had an additional diagnosis of malaria, eight patients (4%) also had UTI and twelve had other diagnoses. Complications of PID were reported in 41 patients (20%); 83 per cent of these were pelvic peritonitis or pelvic abscesses. Clinicians confirmed these as the most common acute complications.

Discussion

Findings from the two approaches (retrospective analysis of case notes and structured interviews of clinicians) were consistent in several areas such as common symptoms (LAP, fever, vaginal discharge), predisposing factors (previous PID, recent TOP), signs (lower abdominal tenderness, vaginal discharge, cervical motion, and adnexal tenderness), preferred investigation (HVS), differential diagnoses (ectopic pregnancy), and common complications (abscess, peritonitis). In the few areas where findings from the two approaches were different, a prospective study design in which clinical data are collected according to defined guidelines could provide a clearer picture.

Demographic profile of patients

The predominantly young age group of PID patients probably reflects sexual activity and has implications for the transmission of STD agents and the development of sequelae following multiple episodes. Other data suggest that young women in Ghana and elsewhere bear the brunt of reproductive morbidity. Eighty-two per cent of gonorrhoea in females in Kumasi occurs in those aged 14-30 years,[4] 39 per cent of women with AIDS in Ghana are aged 20-29 years,[5] and 40 per cent of women with complications of induced abortions are aged 15-20 years.[6] In East Africa, 74-79 per cent of patients with PID were less than 30 years old.[7,8]

Symptoms of PID

Both the retrospective review of case notes and structured interviews of clinicians indicate that LAP is universal in PID diagnosed in the Central Region. The management of PID based on the syndrome of LAP is, therefore, appropriate. The frequency of the other symptoms was assessed from patient notes, voluntary responses by clinicians, and responses by direct questioning. Vaginal discharge and fever were common while abnormal vaginal bleeding, backache, and irregular menses were uncommon by all three measures. However, there were some discrepancies with regard to dysuria and dyspareunia. These differences may be due to incomplete documentation of symptoms or the presence of multiple ailments. The main presenting symptoms of PID obtained from patients' records in the Central Region are similar to those reported for patients in Papua, New Guinea.[9]

Predisposing factors for PID

Any interventions to reduce the incidence of PID should address its predisposing factors. Over two-thirds of the predisposing factors identified in our study were pregnancy-related. This demands an improvement of the quality of reproductive health, and particularly family planning services. In Ghana, 58 per cent of complications of induced abortions occur in those performed outside designated health institutions.[6] The six per cent rate of previous PID is lower than the 51-54 per cent reported in Zimbabwe and Uganda.[7,10] The lower figure in Ghana is probably due to incomplete history or documentation given that most clinicians interviewed had commonly encountered it in their patients. Previous infection is believed to impair local host defences. The risk of herbal use for PID has not been extensively studied partly because patients may not disclose habits that could provoke retribution from hospital staff. Herbal application has been associated with vaginal stenosis and infertility in Ghana.[11]

Promiscuity was identified by clinicians as a common predisposing factor for PID in the region but was not recorded in the case notes. The discrepancy is probably due to a general discomfort to discuss patients' sexual relationships or failure to document such a history. In reports from Zimbabwe and Uganda, 26-38 per cent of patients with PID had multiple sexual partners prior to their admission.[7,10]

There was a prevailing (if questionable) notion of poor genital hygiene as cause of PID — unhygienic practices related to care of panties, infrequent washing particularly during menses, wiping of anal region from back to front after defecation, and exposure to anogenital microbes from communal use of sanitary facilities. Contrary to this notion, several studies have shown that douching is associated with increased risk of PID.[12]

Other relevant history

The sexual and contraceptive practices of patients with suspected PID in the Central Region were hardly documented. However, in a direct observation of clinicians to ascertain the appropriateness of STD case management in the Eastern Region of Ghana, Asamoah-Odei *et al*[13] found that 93 per cent of 53 patients

attending 18 health centres were asked about a history of recent sexual contact. In the latter study, clinicians could have altered their usual management practices. In one hospital in the UK, two per cent of patients with PID attending the accident and emergency (A&E) department compared with 100 per cent of those attending the genitourinary medicine (GUM) clinic had a detailed sexual history recorded.[14] Prospective studies in East Africa have reported age at first intercourse, frequency of intercourse, prostitution, or multiple partners as risk factors for PID.[7,10]

In Papua, New Guinea, 70 per cent of patients developed symptoms of PID within seven days of the onset of their LMP.[9] In this study, we could not assess this relationship directly as the duration of symptoms of PID was usually not recorded. The treatment history of patients prior to their admission was rarely recorded. This information is particularly important in a country where 75 per cent of patients with STDs self-medicate on various antimicrobials in inappropriate doses.[15] Treatment history would influence diagnostic decisions, choice of antibiotics, and promotion of positive health-seeking behaviour.

Relevant signs in PID

The key diagnostic signs in our cases are consistent with those generally recommended.[1] Earlier studies in Ghana reported that doctors in Accra and Kumasi did not perform physical examinations on patients with STDs.[16] More recent reports indicate that 62 per cent of outpatients are physically examined and 33 per cent have their external genitalia thoroughly examined.[13] About half of the patients in our survey were examined vaginally. We suspect others were similarly examined but findings were not recorded. Pelvic examination ruling out other pelvic pathology is essential for the diagnosis of PID. Hospitals identified, in which VEs were infrequently performed, could be targeted for further investigation, monitoring and appropriate intervention to improve their clinical guidelines. Specula were not always available and this prevented some clinicians from performing a speculum examination. While the absence of specula in health centres in Accra and Kumasi[16] may be excusable, their absence in OPDs in district hospitals and other higher level institutions is less acceptable.

Investigations in the management of PID

Investigations were more often requested to rule out other diagnoses than to confirm the diagnosis of PID. WBC count or ESR investigations frequently included in diagnostic criteria were requested in 22 per cent of patients. HVS examination was preferred to endocervical smear examination for the evaluation of PID. Both tests are required where facilities are available, HVS being useful for vaginal organisms such as *T. vaginalis* and vaginosis-associated bacteria, while endocervical swab is useful for gonococci and chlamydia. Tests that were never requested and those that were not considered useful are best grouped together since tests somehow considered not to be useful may never be requested and vice versa. Laparoscopy, which requires facilities known not to be available in the Central Region, and endometrial biopsy, which requires specimens to be sent outside the region for examination, were rarely requested.

Diagnosis and complications of PID

Diagnosing PID in resource poor countries can be difficult. The initial diagnosis of PID has been wrong in 22-23 per cent of cases.[9,17] In Ghana, 68 per cent of 31 cases of ultrasound-confirmed diagnosis of unruptured ectopic pregnancy were initially diagnosed as PID.[18] In the Central Region, the most important differential diagnoses of PID were ectopic pregnancy, septic abortion, and uterine fibroid, conditions in which ultrasonography may clarify the diagnosis. Ultrasonography was requested for about four per cent of our pa-

tients. In Ghana, the supply of essential equipment to health centres and district hospitals is considered a priority for health development.[19] The ultrasound machine is one of such equipment required in district hospitals. Its introduction elsewhere in Ghana has made a great impact on gynaecological practice.[18] Treatment for PID was justifiably instituted without bacteriological confirmation in any of our cases. This contrasts with the practice in the industrialised world where microbiological tests for *Neisseria gonorrhoeae* and *Chlamydia trachomatis* are required for diagnostic confirmation and for monitoring treatment outcome.[1]

Complications of pelvic peritonitis and pelvic abscess were observed in 9 and 7 per cent of in-patients respectively. In comparison, 73 per cent of in-patients in a provincial hospital in Zimbabwe had peritoneal irritation; 15 per cent had pelvic masses and 4 per cent had ruptured tubo-ovarian abscesses. As in Zimbabwe, the case fatality rate in our series was about 0.5 per cent.[20]

Conclusion

The diagnosis of PID in the Central Region of Ghana is essentially clinical. Problems identified with the diagnosis include the failure to take sexual and treatment history, infrequent vaginal examination of patients, absence of specula in the hospitals, and an apparent over-reliance on HVS in the laboratory evaluation of PID. Periodic audit of clinical management and in-service training of clinicians could address some of these concerns.[14,21] The provision of ultrasonography in the district hospitals is likely to improve the management of PID in this region of Ghana.

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