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Acute appendicitis in females — A clinical study of 366 cases

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Summary

A study was carried out on 366 female patients admitted consecutively to Asir Central Hospital with clinical diagnosis of acute appendicitis during the period between 1988 through 1991. In this study, 271 patients had histopathologically proven appendicitis for a diagnostic accuracy of 74%. Ninety-five (26%) patients did not have appendicitis, however, 27 (7.4%) of them had other disorders indicating surgical intervention. Consequently, 18.6% of the patients studied had negative laparotomy. This study showed insignificant ($P > 0.05$) relation between age, site of pain and its duration, presence of urinary symptoms, post-operative complications and hospitalization in one hand, and the final diagnosis on the other hand. The marital status, the presence of gynaecological symptoms, white blood cells count, neutrophils and lymphocytes percentages were, however, significantly related to the final diagnosis ($P < 0.05$). A conservative approach with in-hospital observation and repeated clinical examination of the doubted appendicitis cases are recommended so as to reduce the rate of the negative laparotomy with its considerable complications.

Résumé

Une étude a été effectuée chez 366 patientes admises à L'Hopital Asir Central avec le diagnostique clinique de l'appendicite aiguë entre 1988 et 1991. Deux cents Soixante onze patientes avaient l'appendicite confirmée histopathologiquement avec une précision diagnostique de 74%. Quatre-Vingt-quinze patientes (soit 26%) n'avaient pas d'appendicite mais 27 d'entre elles (soit 7.4%) souffraient des désordres indiquant une intervention chirurgicale. Par conséquent, 18.6% des patientes étudiées ont subi des la paratomies négatives. Cette étude démontre un rapport minime ($P > 0.05$) entre, l'âge, le site de douleur, la présence des symptômes urinaires, les complications post-opératives et l'hospitalisation d'une part et le diagnostique définitif d'autre part. Le statut merital, la présence des symptômes gynécologues, la compte des globules blancs, les pour centages des neutrophiles et des lymphocytes avaient des rapports significatifs avec le diagnostique définitif ($P < 0.05$). Une approche conservative, des observations cliniques et des examens renouvelés des cas d'appendicite douteuse sont recommandées afin de réduire le taux de laparatomie négative avec ses complications considérables.

Introduction

The clinical presentation of acute appendicitis in females can produce diagnostic difficulties and result in a reduced rate of accuracy of the diagnosis[1-5]. Many surgeons will accept a certain rate of negative laparotomy in order to avoid missing an inflammed appendix or its complications, notably perforation[6]. Complications of negative laparotomy, however, are not insignificant[2,3,6-10].

The present work was carried out to study the diagnostic accuracy among female patients admitted to Asir Central Hospital for appendectomy, and to analyze those patients with negative laparotomy and the means by which this could be reduced.

Patients and methods

This study was carried out on 366 females patients who were admitted consecutively to Asir Central Hospital, clinically diagnosed to have acute

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appendicitis and who underwent appendectomy during the period between 1988 through 1991. Data were collected regarding age, nationality, marital status, last menstrual period (LMP), the localization of the pain and its duration and the presence or absence of urinary and/or gynaecological symptoms. The pre-operative white blood cell (WBC) count (total & differential) and the results of urine analysis were noted. The clinical diagnosis and the final histopathological diagnosis were compared. The hospital stay and the post-operative complications were also studied. The data were analyzed using SPSS/PC+ software package. Chi-square and the student "t" tests were used to evaluate the 5 level of significance of the results.

Results

Based on the histopathological examination and the findings at operation, 271 (74%) of the patients had appendicitis with varying degrees of inflammation, some were associated with concommitant gynecological lesions. Of the remaining 95 (26%) patients, who did not have appendicitis, 27 patients had other disorders necessitating surgical intervention, 3 patients had medical diseases which could explain their complaints and 65 had non- specific abdominal pain (Table 1). Consequently, 68 (18.6%) patients had negative laparotomy. The diagnostic accuracy was thus 74% for appendicitis and 81.4% for the decision for laparotomy.

Table 1: The final diagnosis of the studied patients

Final diagnosis	No. & (%)
Appendicitis (All forms):	271 (74%)
Acute appendicitis	237 (87.5%)
Gangrenous appendicies	2 (0.7%)
Perforated appendicies	13 (4.8%)
Appendicular mass	5 (1.9%)
Appendicitis + ruptured corpus luteum or ovarian cyst	11 (4.0%)
Appendicitis + fallopian tube cyst	3 (1.1%)
Non-Appendicitis:	95 (26%)
Gynecological cases	23 (24.3%)
Strangulated Ap. ep. & Mesoappendix*	3 (3.2%)
Foreign body in Abdomen	1 (1.0%)
Parasitic infestation of GIT	2 (2.0%)
Urinary tract infection	1 (1.0%)
Non-specific abdominal pain	65 (68.5%)

* Ap. ep.: appendicies epiploicae

The age range of the patients in the study was 12-70 years (mean 23 + 8.8 S.D.). Three hundred and fifty-four (96.7%) patients were in the reproductive age group. There was non-significant statistical relation ($P > 0.05$) between the final diagnosis and age, nationality, LMP, localization of pain and its duration, presence of urinary symptoms, pregnancy, post-operative complications and hospitalization. A statistically significant relationship ($P < 0.05$) was found, however, between the final diagnosis and the marital status. Among positive appendicitis patients, 153 (56.5%) were married compared with 42 (44.2%) of the non-appendicitis ones. Similarly, those patients with history of gynecological symptoms showed a significant tendency to have gynecological lesions rather than acute appendicitis. The gynecologic lesions are as listed in Table (2).

Table 2: Details of gynecological lesions

Gynecological Lesions	Number of Cases
Ruptured Graffian follicles	13
Ovarian Cysts	5
Ovarian Teratoma	2
Tubal abortion	2
Tortion of Uterine Fibroid	1
Total	23

A significant difference in WBCs count, neutrophils and lymphocytes percentages existed between different stages of appendicitis on one hand and non-surgical cases on the other. The former group had significantly raised WBCs and neutrophils count. The urine analysis was abnormal in 133 (49.1%) patients with appendicitis compared with 33 (34.7%) patients among the non-appendicitis group. The difference is statistically significant. The provisional diagnosis of appendicitis by the admitting doctors was correct in 79% of the cases ($P < 0.05$). After being admitted, the patients were observed until the diagnosis and the decision for laparotomy were made. The mean time lapse between admission and laparotomy for the whole series was 12.24 + 20.06 hours and no significant difference was seen between appendicitis and other pathologies. The duration of operation was significantly longer in patients with negative laparotomy; the average operative time for appendicitis patients being 46.1 minutes, whereas for non-appendicitis patients the average operative time was 51.9 minutes.

Discussion

There has been little progress in the diagnosis of appendicitis in the last decade. The diagnosis of appendicitis can represent a considerable challenge to the surgeon. The diagnostic accuracy of appendicitis in our series is 74% which is comparable with other major series [2,3,8,9,11-14]. In a review of the pathologic diagnosis of 2,216 appendectomy specimens, Blair *et al.* [15], found out that in the group with normal histologic findings, 68% were females and 32% were males. Although the commonest cause of unnecessary appendectomy, seen in females in the reproductive age group, is non-specific abdominal pain, a minority is found to have gynecological pathology accounting for their symptoms[2,6,8,10,11]. In our series, 65 (17.7%) patients had unclear cause for their pain, 3 (0.9%) had non-surgical pathologies and 23 (6.3%) patients had gynecological lesions accounting for their pain. There were more negative appendectomies in single (55.8%) than in married (44.2%) patients with a statistically significant difference. Married patients, in this study, showed more chances of having acute or perforated appendicitis than singles, a finding which was not described in the surveyed literature. Einar and Frank Lewis *et al.* [4,11] described a significant relationship between appendicitis and the phase of the menstrual cycle. They found that appendicitis was more common in the luteal phase (15-28 days) of the cycle while gynecological lesions and normal appendicies were more common in the menstrual (1-5 days) and follicular (6-14 days) phases. Our findings and those of Berry *et al.* [5] do not support the observations of Einar and Frank Lewis *et al.* [4,11]. In our study, however, we could find a significant difference between patients with gynecological symptoms and the incidence of gynecological lesions. The localization of pain and its duration and the presence of urinary symptoms were not significant in this study as observed by others[5,6]. Nausea and anorexia have been described to be reliable discriminants between appendicitis and non-appendicitis conditions[5,12]. This study showed a significant relationship between raised white blood cells count and the neutrophils percentage and the incidence of inflammed or perforated appendix. Similar finding was shown in other series[5,16,17] but some other studies[2,8,9,11] showed this to be of no significance. The presence of abnormal urine analysis does not exclude appendicitis as shown in this study and others[5].

It is worthy mentioning that the complications rate of negative appendectomy, although insignificant in the present series, is very considerable as reported in other studies. Wound infection, adhesive intestinal obstruction, recurrent abdominal pain, chest complications, infertility and even death have been described[2,3,6,8-10,12].

Among other tools of evaluating the status of the appendix is laparoscopy. Lucian *et al.* [18] found that by using laparoscopy, they could reduce the negative appendectomy rate from 10% to 1% in carefully selected cases. Likewise, Deutsch *et al.* [8] were able to cancel 35% of operations in females booked for appendectomy. Other studies, however, discouraged this trend as it takes almost the same time as appendectomy, requires general anaesthesia and may not visualize whole or part of the appendix[12-16]. The role of ultrasonography has been suggested in the evaluation of difficult cases with a high degree of accuracy[19]. Computed tomographic (CT) scan has been applied and has failed[12].

It can be concluded from these findings that a more conservative approach in the management of doubted appendicitis cases would be of benefit in reducing the incidence of negative appendectomies in female patients. A detailed history, a thorough clinical examination including rectal and, when necessary, vaginal examination are essential. Married females in our environment, as shown in this study, should be more suspected than single females as having acute appendicitis. Necessary laboratory investigations including complete blood count, differential leukocyte count and urine analysis should be done and the results carefully interpreted in conjunction with the clinical findings. This should be followed by in-hospital active observation with careful re-examination repeated as necessary. This kind of approach would make the deleterious consequences, notably perforation, unlikely[10-12, 16-17]. Other methods of diagnosis like laparoscopy and ultrasonography need further evaluation.

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