Appendicitis in pregnancy

W. Duqoum[1]

التهاب الزائدة أثناء الحمل

واصف جليل الدُّقم

الخلاصة: أجريت دراسة استعادية للملفات السريرية لـ 16 443 امرأة تم توليدهن خلال الفترة من حزيران/يونيو 1994 إلى حزيران/يونيو 2000، بمستشفى الملكة عالية العسكري، من حيث بالـمَشْهَد السريري، والتحرّيات المُجراة، ونتائج العمليات والتشخيص الهيستوباثولوجي لالتهاب الزائدة أثناء الحمل. وقد اتضح أنه تم إجراء عملية لفتح البطن لعشر نساء بسبب احتمال إصابتهن بالتهاب الزائدة، وكان التشخيص الهيستوباثولوجي إيجابياً في ثمان منهن، كما اتضح أن من النادر حدوث التهاب الزائدة أثناء الحمل، مع اختلاف الـمَشْهَد السريري وتأخر التشخيص عادةً. ويمثل وجود ألم في الجانب الأيمن من البطن عماد التشخيص، بينما لا يمكن الاعتماد على كثرة الكريات البيض والحمى الخفيفة، كما هو عليه الأمر خارج أوقات الحمل.

ABSTRACT The clinical files of 16 443 women delivered during the period June 1994 to June 2000 at Queen Alia Military Hospital were retrospectively studied for clinical presentation, investigation, operative findings and histopathological diagnosis of appendicitis during pregnancy. The result showed that 10 of the women underwent laparotomy for probable appendicitis. Of these, 8 had positive histopathological diagnosis. Appendicitis in pregnancy occurs infrequently. The clinical presentation varies and diagnosis is usually delayed. Right-side abdominal pain is the principal basis for diagnosis, while leukocytosis and low-level fever, as in the non-pregnant state, are unreliable for diagnosis.

L'appendicite pendant la grossesse

RESUME Les dossiers cliniques de 16 443 femmes ayant accouché durant la période allant de juin 1994 à juin 2000 à l'hôpital militaire Reine Alia ont fait l'objet d'une étude rétrospective en ce qui concerne le tableau clinique, l'examen, les résultats opératoires et le diagnostic histopathologique de l'appendicite pendant la grossesse. Le résultat a montré que 10 des femmes avaient subi une laparotomie pour une appendicite probable. Sur celles-ci, 8 avaient un diagnostic histopathologique positif. L'appendicite pendant la grossesse survient peu fréquemment. Le tableau clinique varie et le diagnostic est habituellement retardé. Les douleurs abdominales sur le côté droit constituent la base principale du diagnostic, et la leucocytose et la fébricule, comme dans l'état de non-grossesse, sont peu fiables pour le diagnostic.

[1]*Queen Alia Military Hospital, Amman, Jordan.*
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Introduction

In pregnancy, appendicitis continues to be the most common surgical emergency, with an incidence of 1/1500–2000. It is not affected by pregnancy and occurs equally in all trimesters [*1–4*].

The initial visceral symptoms of appendicitis (e.g. nausea, vomiting, anorexia and periumbilical discomfort) are not altered by pregnancy. Subsequent parietal peritoneal irritation varies during pregnancy with progressive upward and lateral migration of the appendix from the right lower quadrant [*1,2,5*]. Leukocytosis is not helpful in diagnosis due to physiological leukocytosis of pregnancy, but may be of value if elevation of leukocytes occurs within a short period of time or with a left shift [*2,5*]. Peripheral blood leukocytosis > 15 000/mm^3 and granulocytosis > 87% are risk factors for perforation [*6*]. The temperature is seldom above 38 °C, unless perforation with peritonitis or appendicular abscess are formed which lead to higher temperature or tachycardia [*7*].

The impact of appendicitis on pregnancy, especially if there is peritonitis, is premature labour or abortion [*2,3,4,6*]. Maternal mortality of 2% is also reported [*8*]. The frequency of perforated appendicitis, reported to be as high as 43% of cases, remains higher than the perforation rate of non-pregnant patients [*9*], which is estimated at 4%–19% [*10*].

In this study, a retrospective analysis was carried out of all pregnant patients taken to the operating room with provisional diagnosis of acute appendicitis for the period June 1994–June 2000.

Methods

The charts of the pregnant women were reviewed for personal data including age, gestational age, symptoms, temperature on admission, physical findings and investigations. Operative reports were also reviewed, as were the pathological reports. Appendicitis was confirmed by histopathological diagnosis.

Results

Total number of deliveries at our hospital in the period June 1994 to June 2000 was 16 443. The number of pregnant women taken to the operating room with a provisional diagnosis of acute appendicitis was 10. Histopathological diagnosis confirmed acute appendicitis in 8 patients, 4 of whom had perforated appendicitis, while the other 2 patients were negative (i.e. normal appendix). There were 5 patients in the first trimester, 4 in the second trimester and 1 in the third.

The clinical presentation of the patients was variable (Table 1). All had abdominal pain, 5 had nausea and/or vomiting, and 4 had fever and tachycardia. The location of pain was dependent on gestational age. All patients in the first trimester and 1 patient in the second trimester had pain located in the right iliac fossa, while 3 patients felt pain in the right lumbar region. The patient in the third trimester felt pain in the right hypochondrium. Leukocytosis (white blood cells > 15 000/mm^3) was found in 4 patients who had a histopathological diagnosis of perforated appendicitis. Two patients aborted, the first at day five post-operatively, at gestational age of 8 weeks, and the second, 10 days post-operatively (14 weeks gestation). One patient developed pre-term labour at 32 weeks of gestation, 4 days post-operatively.

Discussion

The study showed that the incidence of appendicitis in pregnancy was 0.06%, where-

Table 1 **Clinical presentation by gestational age of 10 pregnant women with appendicits admitted to Queen Alia Military Hospital, Amman, Jordan 1994–2000**

Gestational age (weeks)	No of patients	No. with pain	Pain location	Nausea, vomiting	Fever > 37.5 °C	Tachycardia
< 12	5	5	RLQ	3	1	1
12–24	4	4	RL (3); RLQ (1)	2	2	2
24	1	1	RH	0	1	1

RLQ = right left quadrant.
RL = right lumbar.
RH = right hypochondrium.

as the true incidence (those cases diagnosed by histopathology) was 0.05%. This is consistent with the incidence reported in the literature [*1–4*]. Half of the cases presented in the first trimester — contrary to previous studies which have shown an increase in appendicitis in the second trimester [*8*].

The study showed that the clinical signs that are reliable for diagnosis of appendicitis in non-pregnant populations (the pattern of pain, fever and leuckocytosis) are not reliable in pregnant populations. However, it shows that pain is the most reliable factor, being present in all patients. Displacement of the appendix by the gravid uterus changes the location of abdominal pain and the point of maximal tenderness to a higher and more lateral position [*5*]. Leukocytosis and fever, when present, indicate perforated appendicitis. In this study the perforation rate was 50%, which is higher than previous reports [*9,11,12*]. The higher rate of perforated appendicitis could be explained by delay in diagnosis, because the clinical picture of appendicitis may overlap with diseases of pregnancy itself.

The atypical presentation of appendicitis, added to the uncertainty of diagnosis, results in hesitancy of both the surgeon and obstetrician to subject a pregnant women to anaesthesia and surgery, which in turn leads to delayed diagnosis. In order to avoid such a delay, a high clinical suspicion and confidence in physical examination are the most effective approach in diagnosis of appendicitis in pregnancy.

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Managing complications in pregnancy and childbirth: a guide for midwives and doctors

This manual, and a similar one on the management of preterm and sick newborns, is written for midwives and doctors working in district hospitals. This manual complements and is consistent with the Essential Care Practice Guide for Pregnancy and Childbirth which is prepared mainly for the primary health care level. Together these manuals will provide guidance for health workers who are responsible for the care of pregnant women and newborns at all levels of care. The interventions described in these manuals are based on the latest available scientific evidence. It is hoped that this manual will be used at the side of the patient, and be readily available whenever a midwife or doctor is confronted with an obstetric emergency. The manual is available from: World Health Organization, Department of Reproductive Health and Research, CH-1211 Geneva 27, Switzerland. It is also available free on the Internet at: http://whqlibdoc.who.int/hq/2000/WHO_RHR_00.7.pdf