

ACUTE ABDOMINAL PAIN IN WOMEN OF CHILD-BEARING AGE REMAINS A DIAGNOSTIC DILEMMA

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كثيراً ما تكون آلام البطن الحادة موضع شك وصعوبة في التشخيص عند النساء ذوات السنوات الخصبة مقارنة بالرجال . وتكون الصعوبة بدرجة أكبر أثناء فترة الحمل حيث من المعروف احتمال حدوث الأم البطن بسبب تغيرات الحمل . وهنا يوضع اللوم عادة على اضطرابات الحمل . ولكن يؤدي ذلك أحياناً إلى تأخير التشخيص وتعرض المريضة والجنين إلى مضاعفات وخطورة . وتهدف هذه الدراسة إلى وضع خطة لمعاينة المريضات بصورة سريعة ودقيقة لتفادي المضاعفات . أجريت هذه الدراسة بمستشفى الملك فهد الجامعي بالخبر، تم خلالها مراجعة الدراسات العالمية المماثلة على مدى عشرين عاماً . وقد ركز هذا البحث على الصعوبات في تشخيص الأم البطن الحادة ومحاولات إيجاد الحلول المناسبة . وتم استخلاص أن الأم البطن الحادة لا تزال موضع تحدي للطبيب المعالج . فقد رصدت حالات الأم البطن الحادة وهي تعادل 5% -10% من كل الحالات الطارئة مع اختلاف درجة الخطورة الناتجة عن نوع المرض . ولذلك يجب مراعاة بعض العوامل مثل الحرص ، المعاينة الدقيقة، التعاون المستمر بين قسم الجراحة وقسم النساء والولادة مع الاستعمال الحكيم لأدوات التشخيص الحديثة مجمعة مما يؤدي إلى نتائج مثمرة وإيجابية بإذن الله .

الكلمات المرجعية : الحمل، آلام البطن الحادة، التهاب الزائدة الدودية، انسداد الأمعاء.

Abdominal pain is perhaps the most challenging of all the presenting complaints in the emergency department. It is estimated that it accounts for 5%-10% of all visits. Causes of abdominal pain range from the inconsequential to the life threatening. In addition, it nearly always poses a greater degree of diagnostic uncertainty in women of child-bearing age as compared to males. Such difficulties become more pronounced in pregnant women where the unwritten policy seems to be: If she is pregnant blame the pregnancy. This policy is justified by the favorable clinical outcomes. However, in a small but significant number of patients, this policy has the potential of creating delays and increasing the risk of unwarranted complications. Delays in management may lead to emotional trauma, loss to the society, and the potential for serious liability.

This review was undertaken at King Fahd hospital of the University, Eastern Province of Saudi Arabia, with a literature search covering a period of over twenty years. It mainly highlights the diagnostic difficulties in young women presenting with acute onset abdominal pain, and possible solutions.

It also suggests a policy which includes a careful clinical approach with liberal

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consults between the surgeon and the gynecologist reinforced by a judicious use of the available diagnostic aids leading to potentially favorable outcomes.

Key Words: *Pregnancy, acute abdomen, acute appendicitis, intestinal obstruction*

INTRODUCTION

Abdominal pain is one of the common causes of acute hospital admission.¹ Whenever women of childbearing age present with an acute abdomen, diagnostic difficulties arise as to whether the emergency is surgical or gynecological. Due to the nature of the female pelvic anatomy, the underlying etiology includes a wide range of differential diagnoses. Abdominal pain is an essentially a widespread experience in pregnancy; few women will fail to note, if not complain clinically of abdominal pain at some time during pregnancy.² It has been reported that 1 in 500 pregnancies become complicated by a non-obstetric surgical problem with the high risk of peri-natal morbidity.³ The gravida is usually placed in jeopardy by the general reluctance toward early surgical intervention. The similarity and variations of the signs and symptoms of acute abdominal pain nearly always poses a challenge to the clinician.

Acute appendicitis is the commonest non-traumatic, non-obstetric surgical malady. Its reported incidence complicating pregnancy is 1 in 766 cases,⁴ with overall accuracy in diagnosing it being 60%,⁵ as compared to 80% in non-pregnant women. Perforated appendicitis especially during pregnancy leads to grave outcome with fetal loss rate of up to 35%, mandating prompt diagnosis and early surgical intervention.⁶ Reported fetal complications occurring due to appendectomy were spontaneous abortion (33%) in the first trimester, and (14%) in the second trimester. However, no complications were observed in the third trimester.⁴

Intestinal obstruction is the second commonest emergency with a reported inci-

dence of 3%-5% in non-pregnant women, as compared to 0.02-0.04% in pregnant ones.⁷ Intestinal obstruction due to intussusception and adhesions secondary to intraperitoneal inflammation are rare events during pregnancy. Their occurrence poses difficulties and delays in diagnosis. This is attributed to the overlapping symptoms in addition to the accommodative nature of the abdominal and pelvic cavities which contribute to the delayed presentation.

Colonic cancer, on the other hand, occurs in 0.002% during pregnancy as compared to 3% in non-pregnant women. To date, only 32 cases of colonic cancer arising above the peritoneal reflection during pregnancy have been described in the literature.⁸ Late pregnancy hinders accurate clinical evaluation of intestinal obstruction and is commonly associated with shock leading to maternal and fetal mortality of 20%.⁷

Both estrogen and progesterone predispose to the formation of lithogenic bile, whereas progesterone further inhibits gallbladder contractility, particularly in the second and third trimester.⁹ Cholelithiasis, when symptomatic, is best treated with cholecystectomy, yet the majority of gravid symptomatic patients respond to conservative management. However, reported maternal and fetal loss of 15% occurs with described complications.¹⁰

The incidence of pancreatitis is equal in both pregnant and non-pregnant women, with reported series of 1 in 1000¹¹ and maternal and perinatal mortality up to 38%. The most common cause is secondary to gall bladder disease, followed by alcohol abuse, hyperlipidemia, and viral infection.¹⁰ The specificity of elevated levels of serum

amylase is limited by the fact that cholecystitis, bowel obstruction, and ectopic pregnancy, among others, cause similar and potentially dramatic elevations in serum amylase. Conversely, serum amylase rises physiologically with pregnancy.

Primary liver disease must also be considered in the differential diagnosis. It becomes more pronounced during pregnancy, and may complicate toxemia of pregnancy, commonly associated with disseminated intra-vascular coagulation (DIC), resulting in a mortality rate of 16%.¹²

Acute fatty liver in pregnancy is a serious condition that occurs mainly in the third trimester; it should be suspected in patients presenting with jaundice, nausea, vomiting, abdominal pain and signs of fetal distress. These patients are in critical condition and should be treated in the intensive care unit.¹³ In 1982, Weinstein described a variant of this phenomenon which has been dubbed the "HELLP" syndrome, for Hemolysis, Elevated Liver enzymes, and Low Platelet count.¹⁴ It affects 10%-20% of the cases of severe preeclampsia, 70% of which occurs during pregnancy out of which 15% occurs as early as the second trimester.¹⁵ Failure to recognize this condition may result in both fetal and maternal death. Other causes of primary liver disease include intra-hepatic cholestasis and the more dramatic hepatic rupture, complicating toxemia of pregnancy. These patients present with clinical shock which results in extremely high maternal and fetal mortality. The other differential diagnosis of this hemorrhagic shock is rupture of the splenic artery aneurysm which can occur spontaneously during pregnancy and may give a similar clinical picture.⁶

Peptic ulcer disease and reflux esophagitis with their reported complications occur almost equally in both sexes. The incidence increases with stress, obesity, and increased intra-abdominal pressure. It has been reported that 40% of pregnancies are

complicated by mild to moderate symptoms.¹⁷ Anti-acid therapy usually suffices as adequate therapy. However, if symptoms persist, investigations and treatment for peptic ulcer disease should be considered.

Inguinal hernias diagnosed during pregnancy rarely need surgical intervention. This is mainly due to the protective nature of the pregnant uterus against the hernial defect.¹⁸

Urolithiasis is generally more prevalent in men, but it is noted that the incidence increases slightly during pregnancy. Contributing factors are urinary stasis due to ureteral dilatation and hypomotility, in consequence of ureteral compression by the enlarging uterus, and the relaxing effect of progesterone on smooth muscle, respectively.¹⁹ Renal resistive index is a sensitive and accurate test that can replace intravenous urography in the diagnosis of acute unilateral ureteral obstruction in pregnant women.²⁰ Acute renal failure induced by bilateral ureteric obstruction during pregnancy can be a reversible event.²¹ Patients are usually treated conservatively, since stones with a diameter of 7mm or less pass spontaneously. Surgical intervention is usually indicated in patients with recurrent pyelonephritis complicating nephrolithiasis.

Abdominal pain of unclear etiology was reported in one study as 41.3% of all patients presenting to the emergency department.²² Symptoms may be nonspecific, especially in women in the reproductive age group. As long as no serious cause is identified, patients can be discharged with the diagnosis of non-specific abdominal pain rather than a diagnosis of convenience.

DIAGNOSTIC AIDS

Due to the large spectrum of differential diagnoses in acute abdominal pain in women, exhaustive studies are being undertaken to improve the accuracy of the preoperative diagnosis.

Haematological tests

Even though complete blood count, renal function tests, serum electrolytes, liver function test, serum amylase and lipase levels, pregnancy test, and blood glucose levels are nonspecific, they are considered to be the baseline investigations necessary in patients presenting with acute abdominal pain. In addition, urine analysis and urine culture may assist in identifying genitourinary disease.²³

Ultrasonography

Ultrasound has revolutionized the role of the radiologist in diagnosis of acute abdomen. It is the single most effective tool for exploring the abdomen without opening it.²⁴ Ultrasound is simple, rapid, inexpensive, dynamic, and can be repeated as often as necessary without known harm to the patient. It does, however, require dedication, skill, and experience. Unskilled use of the ultrasound may lead to medical disaster, and thereby, profound mistrust by the patient and referring clinicians. Performance of ultrasound has a definite impact on the clinical management of the acute abdomen. It prevents unnecessary delays, and minimizes the number of negative laparotomies.²⁵ Doppler ultrasound is used in determining the renal resistive index which is used to assess the degree of the ureteric obstruction in pregnant women. It is considered positive with a value of 0.70 or greater, and 0.04 or greater, respectively.²⁰

CT-scan

With the recent advances in CT technology, this modality has become even more useful in determining the cause of an acute abdomen. CT-guided interventional procedures can also give additional specific diagnostic information, or provide therapeutic options. It is the second-line diagnostic modality in women of child-bearing age with reported sensitivity of 98%, specificity of 83%, and

accuracy of 93%.²⁶ The reported sensitivity of CT in diagnosing acute appendicitis is 98%,²⁷ it is 93% in diverticulitis,²⁸ 90-94% in intestinal obstruction,²⁹ and 56% in bowel ischemia.³⁰ It may also play an important role in the diagnosis and management of acute cholecystitis, liver diseases, acute pancreatitis, intra-abdominal collections, pelvic and retroperitoneal pathology. The reluctance to use this ionized radiation reduces its usefulness use during pregnancy.

Barium enema

This contrast study has limited use in the diagnosis of acute abdomen. It is rarely used when the above two modalities fail to accurately define the diagnosis. Differentiation from perforating carcinoma may be difficult to detect by CT-scan, and barium enema may be necessary in 10% of cases.³¹ Perforation from the procedure can occur in inflamed or ischemic bowel. Therefore, it is best reserved for cold cases.

Fine catheter peritoneal fluid analysis (FCPFA)

This diagnostic aid is reported to be safe and may help to avoid negative laparotomies.³² The fluid obtained can be sent for cytology and lactic acid levels.³³ A neutrophil proportion of more than 50% indicates a positive cytology result. In addition, lactic acid levels are reported to be significantly higher in the peritoneal fluid than in the plasma of patients with hollow viscus perforation, bowel gangrene, peritonitis, or intra-abdominal abscess.

Laparoscopy

With the advent of minimally invasive surgery, laparoscopy has become a popular tool as a diagnostic and therapeutic modality in abdominal and pelvic pathology. It allows full visualization of the abdominal cavity in its entirety and has shown to be accurate in the diagnosis and management of acute

abdominal pain with the reduced incidence of complications as compared to negative laparotomies. However, it is invasive, and requires general anesthesia.³⁴⁻³⁶

CLINICAL APPROACH

A thorough clinical approach to patients presenting with acute abdominal pain cannot be overemphasized. The junior surgeon is usually the first person to handle patients with such a complaint and the decision to operate is based on the clinical judgment and available investigations. Accuracy in diagnosis is highest in young males, but is far lower in children and women of child-bearing age.³⁷

Over a period of ten years (1984-1994) at King Fahd Hospital of the University, Al-Khobar, all women of child-bearing age referred to the surgical unit with questionable diagnosis were reviewed. The total number of patients was 162. In the majority of cases (137), an accurate diagnosis was reached and the patients were treated accordingly. However, 25 patients had equivocal signs and symptoms, which mandated more tests for a definitive diagnosis. It should be noted that 8 out of the 25 patients were pregnant. There was an average delay of 6 hours to 3 days in both the investigations and treatment of these patients. The diagnosis in 4 patients was only made at laparotomy. Detailed history, careful clinical examination, liberal use of diagnostic aids and consultations between the surgeon and the gynecologist are necessary in order to achieve maximum accuracy in the diagnosis. Premature conclusions may lead to diagnostic inaccuracy and potential medical disaster.³⁸

Some studies reported the lowest unnecessary laparotomy rates following a policy of active observation as an alternative management. However, this is frequently difficult to implement by the busy and stressed junior surgeons.³⁹

CONCLUSION

Abdominal pain in women of child bearing age remains a diagnostic dilemma. Causes range from the inconsequential to the life threatening. To avoid unnecessary laparotomies and improve the outcome, a clear-cut policy acceptable to both surgeons and gynecologists is to be outlined. This should include: (a) A careful combined clinical approach between the two disciplines; (b) Reinforcement by the judicious use of the available diagnostic aids; (c) Early surgical intervention as deemed necessary.

REFERENCES

1. Hawthorn IE. Abdominal pain as a cause of acute admission to hospital. *J R Coll Surg Edinb* 1992; 37: 389-93.
2. Setchell M. Abdominal pain in pregnancy. In: Studd J (ed): *Progress in Obstetrics and Gynecology*. Vol. 6. London: Churchill Livingstone; 1987. pp. 87-99.
3. Griffen WO, Dilts PV, Roddick JW. *Current Problems in Surgery: Non-obstetric Surgery During Pregnancy*. Chicago: Yearbook Medical Publishers; 1969.
4. Andersen B, Nielsen TF. Appendicitis in pregnancy: diagnosis, management and complications. *Acta Obstet Gynecol Scand* 1999; 9: 758-62.
5. Weingold AB. Appendicitis in pregnancy. *Clin Obstet Gynecol* 1983; 26:801-9
6. Kammerer WA. Non-obstetric surgery during pregnancy. *Med Clin N Am* 1979; 63: 1157-64.
7. Davis MR, Bohon CJ. Intestinal obstruction in pregnancy. *Clin Obstet Gynecol* 1983; 26: 832-42.
8. Balloni L, Pugliese P, Ferrari S, Danova M, Porta C. Colon cancer in pregnancy: report of a case and review of the literature. *Tumori* 2000; 86: 95-7.
9. Printen KJ, Ott RA. Cholecystectomy during pregnancy. *Am Surg* 1978; 44:432-4.
10. Saunders P, Milton PJD. Laparotomy during pregnancy: An assessment of diagnostic accuracy and fetal wastage. *BMJ* 1973; 21:165-7.
11. Jouppila P, Mokka R, Larmi TKI. Acute pancreatitis in pregnancy. *Surg Gynecol Obstet* 1974; 139:879-82.
12. Rolfes DB, Ishak KG. Liver disease in toxemia of pregnancy. *Am J Gastroentol* 1986; 81:1138-44.
13. Cejudo E, Helguera A, Garcia E. Acute fatty liver in pregnancy. Experience of 7 years. *Ginecol Obstet Mex* 2000; 68:191-7.
14. Weinstein L. Syndrome of haemolysis, elevated liver enzymes, and low platelet count: a severe

- consequence of hypertension in pregnancy. *Am J Obstet Gynecol* 1982; 142:159-67.
15. Haram K, Bjorge L, Guttu K. HELLP Syndrome *Tidsskr Nor Laegeforen* 2000; 12: 1433-6
 16. Al-Arfaj AL, Khawaja SS, Ul-Haque A, Mohanna M. Survival of mother and child after splenic haemorrhage during labour. *Eur J Surg* 1993;159:245-8.
 17. Casrol L De P. Reflux esophagitis as a cause of heart-burn in pregnancy. *Am J Obstet Gynecol* 1967; 98 :1-10.
 18. Bocchi P. In the 21st century. Meeting of the American Society and the European Hernia Society. Toronto: Canada; 2000.
 19. Schulman A, Herlinger H. Urinary tract dilatation in pregnancy. *Br J Radiol* 1975; 48:638-45.
 20. Shokeir AA, Mahran MR, Abdulmaaboud M. Renal colic in pregnant women: role of renal resistive index. *Urology* 2000; 3:344-7 .
 21. Khanna N, Nguuen H. Reversible acute renal failure in association with bilateral ureteral obstruction and hydronephrosis in pregnancy. *Am J Obstet Gynecol* 2001;2: 239-40.
 22. American College of Emergency Physicians: Clinical policy for the initial approach to patients presenting with a chief complaint of nontraumatic acute abdominal pain. *Ann Emer Med* 1994; 23: 906-22.
 23. Marchant DJ. Urinary tract infections in pregnancy. *Clin Obstet Gynecol* 1978; 21: 922-9.
 24. Julien B. C. Puylaert. When in doubt, sound it out. *Radiology* 1994; 191:320-1.
 25. Puylaert JBCM, Rutgers PH, Lalisang RI. A prospective study of ultrasonography in the diagnosis of appendicitis. *N Eng J Med* 1987; 317: 666-9.
 26. Bettina S, Vassilios R. CT of the acute abdomen: findings and impact on diagnosis and treatment. *AJR* 1994;163:1317-24.
 27. Malone AJ Jr, Wolf CR, Malmel AS, Melliere BF. Diagnosis of acute appendicitis: value of unenhanced CT. *AJR*1993;160:763-6.
 28. Neff CC, vanSonnenberg E. CT of diverticulitis: diagnosis and treatment. *Radiol Clin North Am* 1989; 27:743-52.
 29. Megibow AJ, Balthazar EJ, Cho CK, Medwid SW, Birnbaum BA, Nwz ME. Bowel obstruction: evaluation with CT. *Radiology* 1991; 180:313-8.
 30. Alpern MB, Glazer GM, Francis IR. Ischemic or infarcted bowel: CT finding. *Radiology* 1988; 166:149-52.
 31. Cho KC, Morehouse HT, Alterman DD, Thornhill BA. Sigmoid diverticulitis: diagnostic role of CT- comparison with contrast enema studies. *Radiology* 1990; 176: 111-5.
 32. Blazeby JM, Tulloh BR, Adams DCR, Poskitt KR, Bristol JB. Fine-catheter peritoneal cytology in the diagnosis of acute abdominal pain. *Br J Surg* 1994; 81:648.
 33. Delaurier GA, Ivey RK, Johnson RH. Peritoneal fluid lactic acid and diagnostic dilemmas in acute abdominal disease. *Am J Surg* 1994; 167:302-5.
 34. Sportos NM, Eisenkop SM, Spirtos TW. Laparoscopy: a diagnostic aid in cases of acute appendicitis. *Am J Obstet Gynecol* 1987; 156: 90-4.
 35. Taylor EW, Kennedy CA, Dunham RH, Bloch JH. Diagnostic laparoscopy in women with acute abdominal pain. *Surg Lapar and Endoscop* 1996; 5:125-8.
 36. Paterson-Brown S, Eckersley J, Sim AM, Dudley H. Laparoscopy as an adjunct to decision making in the acute abdomen. *Br J Surg* 1986; 73:1022-4.
 37. Deutsh AA, Shani N, Reiss R. Are some appendicectomies unnecessary? An analysis of 319 white appendices. *J R Coll Surg Edinb* 1983;18:161-3.
 38. Bates T. Avoiding inappropriate surgery: discussion paper. *F R Soc Med* 1990; 8: 176-8.
 39. Thompson HJ, Jones PF. Active observation in acute abdominal pain. *Am J Surg* 1986;152:522-5.