Case Report

Unexplained Peritonitis due to *Neisseria Gonorrhoeae* Secondary to a Sterile Tubo-ovarian Abscess

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Kuwait Medical Journal 2015; 47 (2): 166 - 167

ABSTRACT

A 43-year-old woman presented to the surgical emergency department with acute abdominal pain associated with nausea, vomiting, constipation, fever and dysuria. Exploratory laparotomy was performed based on clinical diagnosis of acute appendicitis. Post-laparotomy, the diagnosis of pelvic inflammatory disease (PID), left tubo-ovarian abscess and peritonitis due to *Neisseria gonorrhoeae* was made. The patient responded well to antibiotics and surgical management but was lost to follow-up.

KEY WORDS: neisseria gonorrhoeae, pelvic inflammatory disease, peritonitis, sexually transmitted disease, tubo-ovarian abscess

INTRODUCTION

*Neisseria gonorrhoeae* is the etiological agent of gonorrhea, a sexually transmitted disease. In females, the infection involves endocervix giving rise to increased or altered vaginal discharge in 50% of the patients while the other 50% cases remain asymptomatic. If left untreated, gonorrhea can lead to serious complications, such as, pelvic inflammatory disease (PID). Bacteremia due to *N. gonorrhoeae* causes disseminated gonococcal infection, which may result in arthritis, endocarditis, skin infections and meningitis, whereas peritonitis remains a rare complication.

CASE REPORT

A 43-year-old multigravida woman, an expatriate from India working as a servant in a Kuwaiti household, presented to the surgical emergency in August, 2008 with acute abdominal pain of one day duration. The pain was localized in the right iliac fossa and associated with nausea, vomiting, constipation, fever and dysuria. Signs and symptoms of genital infection were absent. She was diabetic and on hypoglycemic treatment for the past five years and other than that, her past medical history was unremarkable. No history of genital infection or any surgical procedure could be elicited. Although being away from her spouse, she denied indulging in extramarital relationship while working in Kuwait for more than one year. On physical examination, the patient appeared to be in pain. Her pulse rate was 120/ min, temperature of 39 °C, respiratory rate of 24 / min and blood pressure was 90 / 60 mmHg. Abdominal examination revealed generalized tenderness and voluntary guarding localized to the right iliac fossa. There was no organomegaly or shifting dullness and bowel sounds were audible. Chest examination was normal.

Initial laboratory work up showed elevated white blood cell count of 20.9 x 10^9/l (neutrophils 92.4%, lymphocytes 5.6%), hemoglobin concentration 13.5 g/l, C-reactive protein 265 mg/l (normal range < 8.0 mg/l), blood glucose 21.5 mmol/l, serum creatinine 79 μmol/l, potassium 3.6 mmol/l, sodium 133 mmol/l and normal liver function tests. Urinalysis was significant for the presence of glucose, ketones and nitrates but negative for leukocytes.

In view of the patient’s history and laboratory results, a presumptive diagnosis of acute appendicitis was made and an exploratory laparotomy was performed approximately 20 hours after admission. Surgical exploration revealed a normal appendix, pyogenic pelvic inflammation and inflammatory reaction involving small intestines and in the vicinity of appendix. Although the uterus appeared normal,
left-sided tubo-ovarian abscess (TOA) was detected, which was drained and the pus was sent for culture. After proper abdominal toilet, a Malecot catheter was left in place for post-operative abdominal drainage. Antibiotic therapy with cefuroxime, clindamycin and metronidazole was continued and the patient was transferred to ICU in view of septicemia, respiratory failure, electrolyte imbalance and uncontrolled diabetes with ketoacidosis.

**Microbiology**

The culture of pus from TOA as well as blood and urine failed to grow any organisms. However, the culture of draining fluid through Malecot catheter yielded scanty but pure growth of pale grey colonies on 5% sheep blood agar, chocolate agar and Brucella agar. The isolate was identified as *N. gonorrhoeae* by Gram-stained smear findings, positive oxidase and negative DNase tests and by API-NH (bioMerieux, France); profile number 1001. The identification was confirmed by a commercial DNA assay (BD Probe Tec™ ET Chlamydia trachomatis and Neisseria gonorrhoeae Amplified DNA Assays, Becton Dickinson, Sparks, MD, USA). Following this information, culture of endocervix was attempted but failed to isolate *N. gonorrhoeae*. Ideally, we would have preferred to repeat amplified DNA assay on the endocervical sample as well, but it was inadvertently missed out.

**DISCUSSION**

Ascending infection through lower genital tract is considered to be the most acceptable theory in the causation of PID, which may lead to the development of a TOA. In almost 99% cases, acute PID is consequent to ascending infection, whereas in < 1% of cases, other routes such as transperitoneal, hematogenous or lymphatic spread are suggested[1]. Although *N. gonorrhoeae* is considered one of the common causes of lower genital tract infections and associated PID, its role in the formation of TOA has not been well-substantiated. In many articles in the literature, it has been pointed out that the etiology of PID complicated by TOA is usually polymicrobial involving both aerobic and anerobic microbial flora[2]. Interestingly, *N. gonorrhoeae* has not been found to be among the spectrum of microorganisms isolated from TOA[2,3]. In our case, the culture of the pus from TOA failed to grow any microbes. Arguably, pre-operative antibiotics could have resulted in sterile pus although persistence of microorganisms is more likely expected because of low redox potential in pus, poor penetration of antimicrobials, high levels of antibiotic degrading enzymes and impaired phagocytosis by polymorphonuclear leukocytes found within abscesses. Complications like peritonitis due to *N. gonorrhoeae* remains a rarity with only a few reports published in the literature[4-6]. In a case report published in 2009[4], *N. gonorrhoeae* was identified by nucleic acid amplification and not by culture, which is considered the gold standard. The striking similarity that emerges from these cases including ours is, that all patients were women aged over 30 years, who presented with acute abdomen and the final diagnosis was possible after surgical intervention followed by isolation of *N. gonorrhoeae* from purulent exudates in the peritoneal cavity.

**CONCLUSION**

In women the possibility of sexually transmitted diseases (STD) and their complications such as acute abdomen should be kept in mind. The surgeons should be aware of this entity and should ask for gynecological advice. Specific microbiological diagnosis is important in guiding the appropriate therapy.

**ACKNOWLEDGMENT**

We wish to thank Dr. Ambly Kumaran for her contribution by sharing with us the operative findings mentioned in the manuscript.

**REFERENCES**