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## RESEARCH ARTICLE

# PREVALENCE OF SALPINGITIS IN TUBAL ECTOPIC PREGNANCIES DIAGNOSED AT A TERTIARY HOSPITAL IN CENTRAL SOUTH AFRICA

<sup>1</sup>Tshepang Arthur Motsepe, <sup>2</sup>Uamunovandu Tjinjeka, <sup>2</sup>Collen Maipelo, <sup>2</sup>Alan Chanda and <sup>2</sup>Maxwell Mokantse

<sup>1</sup>Sefako Makgatho Health Sciences University, Clinical Research Division, Pretoria

<sup>2</sup>University of the Free State, Faculty of Health Sciences, Bloemfontein

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### ABSTRACT

**Background:** Salpingitis is the inflammation of the fallopian tubes with consequences such as tubal occlusion, infertility, tubal ectopic pregnancies and chronic pelvic pain. This study was conducted to determine the prevalence of salpingitis induced ectopic pregnancies in females who have undergone salpingectomy and their specimen sent for anatomical pathology analysis. **Methods:** Ninety four specimens were collected from 01st February to 31st December 2006. The specimens were observed under a multi-head microscope for tubal patency and plasma cell infiltration, which were used to classify salpingitis as mild, moderate or severe. The results indicated 53%, 10% and 2% for mild, moderate and severe salpingitis, respectively. The prevalence rate of salpingitis was determined at 65%. This prevalence rate is very significant and shows that salpingitis is a major cause of tubal ectopic pregnancy in our setting. **Conclusion:** Salpingitis mainly affects women in their reproductive years, and this may lead to a health crisis. **Contribution:** Women and child healthcare form the cornerstone of social justice in any society. Radical measures should be employed at primary health care level to deal with sexually transmitted infections, and to educate young women and men on safe sexual practices.

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## LITERATURE REVIEW

Ectopic pregnancy occurs when the developing blastocyst implants anywhere other than the endometrial lining of uterus. The incidence varies from place to place even in the same country, one of the determining factors being the frequency of pelvic infections.<sup>1</sup> There are two major types of ectopic pregnancies namely; tubal and non-tubal pregnancies. A developing blastocyst may be trapped in the fallopian tubes en route to the uterine cavity resulting in the tubal ectopic pregnancy. In contrast, non-tubal ectopic pregnancy occurs anywhere other than the fallopian tubes.<sup>2</sup> The fallopian tube is approximately 10-12cm in length and can be divided into four segments; infundibulum, ampulla, isthmus and intramural which are arranged sequentially from the ovary to the uterus. Tubal ectopic pregnancy may occur in any segment of the fallopian tube and hence categorised according to the location of implantation. These are fimbrial, ampullary, isthmic and interstitial respectively from the ovary to the uterus.<sup>3</sup> The occurrence of tubal ectopic pregnancy increases with the following risk factors; salpingitis, oophoritis, decreased peristaltic motility of the smooth muscle, immotility of cilia, tubal surgery for infertility, use of ovulation induction and assisted reproduction, prior pelvic inflammatory disease (PID), abnormally reduced lumen size and increased use of intra-uterine device (IUD).<sup>2</sup> Pelvic inflammatory diseases is a general term used for infection of one or more of the pelvic organs or structures, which include the fallopian tube, ovaries, parametrium and pelvic peritoneum.<sup>2</sup> In most cases, the infection starts in the uterus, or the cervix, and spreads upwards to involve the ovaries, pelvic peritoneum

and the oviducts.<sup>4</sup> When an infection spreads to the oviduct an inflammation occurs, this inflammation is called salpingitis. Salpingitis is a serious reproductive-tract disease with sequelae that include tubal occlusion, infertility, tubal ectopic pregnancy, and chronic pelvic pain. This syndrome is most accurately diagnosed by laparoscopic confirmation of Fallopian-tube inflammation in women presenting with acute pelvic pain and pelvic tenderness, consistent with pelvic inflammatory disease (PID).<sup>5</sup> Salpingitis can be divided into three major types: acute, chronic and granulomatous. Acute salpingitis is a purulent inflammatory process usually secondary to passage of bacteria from uterine cavity into the tubal lumen. *Neisseria gonorrhoea* has been considered the most causative organism. Other causes include *Chlamydia trachomatis*, anaerobic bacteria especially *Bacteroides* species, *peptostreptococci* and *Escherichia coli*. Following infection a brisk diapedesis of granulocytes occurs from the capillaries into the mucosa and lumen of the tube, there is vascular engorgement and oedema of all tubal layers. Tubes examined histologically shows a moderate infiltration with chronic inflammatory cells, some neutrophils and focal epithelial ulceration.<sup>6</sup> Endosalpingeal rugae and villi become enlarged and bulbous with the columnar cells showing varying degrees of degeneration.<sup>7</sup> Chronic salpingitis results from complications of acute salpingitis due to lack of treatment. The histological examination will show that the tubes lumen has become divided into multiple, irregularly sized spaces so that a pseudo follicular pattern of glands appears to have replaced the interior surface lining of the tube. The epithelial surface covering the mucosa is now formed by regenerated columnar ciliated cells while the lamina propria may contain an increased amount of fibrous connective tissue, ectatic thin walled blood vessels, and sparse to

moderate amount of lymphocytes, histiocytes and plasmocytes.<sup>7</sup> Granulomatous salpingitis is commonly known as genital tract tuberculosis, whereby the tubal walls is thickened, tubal lumen is dilated and close inspection of the serosal surface will often reveal numerous minute, gray-white granulomas. In microscopic inspection, typical tubercles with caseation, giant cells, and epithelioid cells are observed. The glandlike pattern produced by fusion of plicae and proliferation of mucosal cells closely simulates the appearance of adenocarcinoma. The common causes of tubal lumen inflammatory response is foreign substance induced, like iodinated oil - Lipiodol, used in the past as a contrast material in the radiographic testing.<sup>8</sup> In a study conducted on the prevalence of chlamydial trachomatis infections in women with ectopic pregnancies, sections were prepared at a distant site of the ectopic pregnancy and microscopically examined for evidence of lymphocytic and plasma cell infiltration. These pathologic features were chosen for particular scrutiny because neither cell type is found in the normal fallopian tube; polymorphonuclear leukocytic infiltration can result from the ectopic implantation per se.<sup>9</sup> However, we are not aware of any specific studies that have been conducted on the prevalence of salpingitis in tubal ectopic pregnancy.

**Motivation for the Study:** The motivation of this study was to establish the importance of salpingitis as a cause of tubal ectopic pregnancy in the area served by the National Health Laboratory Services (NHLS) in Bloemfontein. We were not aware of any study that has been conducted in the Free State Province on salpingitis in relation to tubal ectopic pregnancy.

**Aims:** The aim of this study was to determine the prevalence of salpingitis induced ectopic pregnancies in women who have undergone undergoing salpingectomy and their specimens sent to the NHLS in Universitas Hospital, Bloemfontein.

## METHODS

**Study Design:** Descriptive study design: the information gathered was used to describe the prevalence of salpingitis in patients with tubal ectopic pregnancy.

**Study population:** The study population consisted of women who had presented with tubal ectopic pregnancy, underwent salpingectomy and their fallopian tubes transported to the NHLS at the Universitas Hospital for pathological examination. This laboratory receives specimens from the Free State Province and part of the North West Province. Our study population included all the specimens received from the NHLS from 01st February to 31st December 2006. Cases excluded from the study were those where the fallopian tube has been destroyed by the ectopic pregnancy and the underlying pathology cannot be assessed.

**Sampling:** We received 94 specimens over a period of 10 months hence the study population was small. Therefore all the specimens collected were included in the study.

**Measurements:** The specimens were directly observed by the researchers under the microscope and assessed for evidence of lymphocytic and plasma cell infiltration. Researchers decided on whether the salpingitis was severe, moderate or mild based on the number of plasma cells in the specimen. A high infiltration of plasma cells was classified as severe salpingitis. Moderate salpingitis was an intermediate infiltration of plasma cells. Mild salpingitis was a low infiltration of plasma cells. If there was no cell infiltration then the specimen was classified as no apparent salpingitis.

**Analysis:** The prevalence was calculated from the following equation;

$$\text{prevalence of salpingitis} = \frac{\text{total number of salpingitis}}{\text{total number of tubal pregnancy}}$$

Reports of the specimens were collected to acquire the ages of the women who presented with tubal ectopic pregnancy and specimens were handed in for pathological examination.

### Methodological Errors

#### Researcher (observer) errors

1. During observation, the researcher's conclusive assessment was subjective and hence introduces errors. To avoid this error, a single specimen was observed by the whole research team on a multipoint microscope at the same time hence reducing error by making a group consensus.
2. The specimen may be obscured with blood resulting from surgical procedures thus influencing the tissue morphology leading to false observation. With experience and training, the observers were able to rule out the influence of blood on the tissue.

#### Instrumental errors

1. Preparation techniques may have influenced the quality of the tissue slide, hence selecting a good quality slide was done for each case of tissue samples. This was done by the study leader.

**Ethics:** The study received ethical clearance from the University of the Free State, Faculty of Health Sciences. The patient's confidentiality was ensured by using the specimens without their personal identification. Permission to perform the study was obtained from the Department of Anatomical Pathology and from the executive council of Universitas Tertiary Hospital.

## RESULTS

Ninety four specimens were collected during the period of February to December 2006. Figure 1 shows a graphical illustration of the prevalence of salpingitis according to the different pathological classifications.

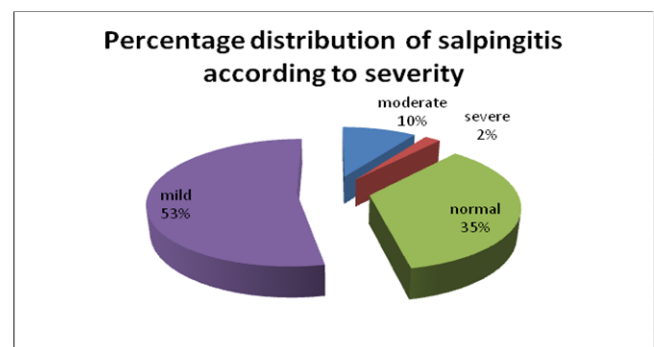


Figure 1.

Approximately 65 % of specimen demonstrated salpingitis (95% confidence interval 54.4; 74.5), and salpingitis was further graded based on its severity. Eighty five reports were obtained from the 94 specimen, and 9 had no reports (Table 2). The table below indicates the distribution of salpingitis according to severity with age association.

Table 1. Distribution of salpingitis according to severity and age association

Tissue morphology	Number of specimen	Range	Mean age
Normal	29	21-44	28
Mild	46	19-40	28
Moderate	9	28-39	29
Severe	1	34	34
Total	85		27.9

## DISCUSSION

The prevalence of 65% is significantly high and indicates that salpingitis is a significant cause of tubal ectopic pregnancy in our setting. This means that sexually transmitted infections, such as chlamydia and gonorrhoea, are quite common as they affect women in their reproductive ages. This is consistent with the findings showing that in the past twenty years, there has been an increase in the number of ectopic pregnancies due to the rising frequency of salpingitis.<sup>2</sup> Figure 1 shows that most of the cases were mild (53.2%) with the least numbers being severe (2.1%). It is perceived that most women with severe forms of salpingitis would find it difficult to conceive due to their tubal lumen being occluded.<sup>5</sup> Following the same line of thinking, most numbers were seen in the milder forms of the disease probably due to the ability of the spermatozoa to swim passed the diseased non obstructed segment of the tube to still allow fertilisation to occur. Table 1 shows an age range of 19 to 44 years with the mean 28 years. This finding indicates that salpingitis mainly affects women in their reproductive years, and this may lead to a health crisis. There is a trend showing an increase in the mean age in association with severity of salpingitis (Table 1). However, we did not find any relevant literature to explain this phenomenon. However, this could be accounted for by the expected likelihood of recurrent and chronic infections which would probable occur over time with age. The lack of clinical data limited the study as researchers depended on short clinical description of patients noted on the pathology request forms. Therefore the study mainly depended on data generated by the researchers in their analysis of specimens. Information on sexual practices, number of pregnancies, previous operations, contraceptive use and type and more, though useful, fell outside the paradigm of this study.

## CONCLUSION

Women and child health form the cornerstone of social justice in the society. The yardstick to measure social reforms and a country's level of sophistication is embedded in services rendered to vulnerable groups, including women. Therefore salpingitis, as shown in the study, is seen to be a major cause of infertility and tubal ectopic pregnancy. Radical measures should be employed at primary health care level to dealing with sexually transmitted infections, and educating both young women and men on safe sexual practices. Such strategies are not aimed at remedying the problem of salpingitis in isolation, but will partly address other social ills, including teenage pregnancy, high HIV/AIDS transmission, early school dropout and poverty, among others.

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