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Ectopic pregnancy - etiology, modern diagnostic and
therapeutic approach

Diploma thesis

Prague, March 2010

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Master's programme of study

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Date and year of defence: 7th of April, 2010

Written Declaration

I declare that I completed the submitted work individually and only used the mentioned sources and literature. Concurrently, I give my permission for this diploma/bachelor thesis to be used for study purposes.

In Prague on March 30th, 2010

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1. Abstract

An ectopic pregnancy is an abnormal kind of pregnancy, which occurs outside the uterus. The term “ectopic” was adapted from the Greek word, ektopos, which means “out of place”. It is a major cause of maternal morbidity and mortality when misdiagnosed or left untreated, and accounts for as much as 9% of maternal death in this USA(13). The condition is thought to be an error or flaw of the human reproductive physiology, which allows the fertilized egg to implant and grow outside its natural location. Studies has shown that approximately 1-2% of pregnancies are ectopic and 97% of these occur in the fallopian tube (so called tubal pregnancies)(6). Less commonly, the ectopic pregnancy is in cervical, ovarian, or intra-abdominal sites(13). Some conditions can blocks or slows down the normal way of a fertilized egg through the fallopian tube to the uterus (3).It is believed that the fertilized egg gets stuck on its way and that the most common cause is a scarred, damaged or misshapen tube(10). The abnormally implanted gestation grows and draws its blood supply from the site of implantation. As the gestation enlarges, it creates the potential for organ rupture because only the uterine cavity is designed to expand and accommodate fetal development. The rupture can result in massive internal hemorrhage that threatens the mother’s life unless promptly diagnosed and treated. In addition to the immediate morbidity caused by ectopic pregnancy, the woman's future ability to reproduce may be adversely affected as well (13).

Half of ectopic pregnancies resolves without treatment. These are the tubal abortions. Today the advent of methotrexate treatment for ectopic pregnancy has reduced the need for surgery; however, surgical intervention is still required in case of rupture or danger of doing so.

Some risk factors are belived to increase the incidence of ectopic pregnancy more than others. These include Pelvic inflammatory disease and Assisted reproductive methods. Recent studies has shown that smoking contributes to this increase. Researchers has therefore concluded that awareness of the role of smoking in public health is important for prevention of ectopic pregnancy (5)

2. Introduction

Early pregnancy disorders account for most of the emergency gynaecological admissions in Europe and are an important cause of maternal morbidity and mortality throughout the world. This thesis is a summary of many professional articles written about ectopic pregnancy.

The first section of this literature includes a brief history followed by incidence and frequency of the disorder. It also includes a discussion of the different causes, risk factors, approaches to diagnosis and treatments used today. The majority of the second section is focused on smoking as a risk factor for ectopic pregnancy. It is a summary of results taken from different studies conducted in Europe and the United States. Finally, the third section concentrates mainly on how to decrease the incidence of ectopic pregnancy through primary and secondary prevention.

The purpose of this paper is to explore modern diagnostic and therapeutic approaches and to focus on the main risk factors of ectopic pregnancy and their importance. Since many of these factors are already well known to be causative, this literature review explores less defined possible etiologies. This paper found a focus on smoking as a risk factor and studied articles referencing smoking in early pregnancy disorders. Is smoking an important factor in increasing the incidence of ectopic pregnancy? There have been many studies conducted among women smokers that have had an ectopic pregnancy. All the researchers came to the same result that women who smoke cigarettes have a higher risk of ectopic pregnancy; which may contribute to the increasing incidence worldwide. This thesis illustrates the importance of making this information better known among women smokers that may wish to one day become pregnant or who are at risk of becoming pregnant.

3. History

Ectopic pregnancy was first recognized in the 11th century, and until the 18th century considered fatal. John Bard was the first surgeon who successfully treated ectopic pregnancy with abdominal surgery in New York City in 1759. The survival rate was very low and up to the 19th century and laparotomy carried grave risk. 5 out of 30 did not survive the procedure. By the 20th century, great medical improvements, such as anesthesia, antibiotics and blood transfusion, decreased maternal mortality rate due to ectopic pregnancy. Today increased knowledge, modern diagnostic methods and treatment are factors that improve care and prognosis for the women affected by ectopic pregnancy.

4. Incidence and Frequency

A gradual increase in the rate of ectopic pregnancies has been observed in the last three decades. Center for Disease Control and Prevention reported 17,800 in 1970 and in 1992 there were approximately 108,800 cases reported. More than 58,000 of these were hospitalized (13).

The incidence has risen six times since 1970, and today 2% of all pregnancies are believed to be ectopic. Concurrently, however, the case-fatality rate has decreased from 35.5 deaths per 10,000 cases in 1970 to 2.6 per 10,000 cases in 1992. Still ectopic pregnancy is the leading pregnancy-related cause of death during the first trimester in the U.S at 9%(13).

5. Etiology

Several factors increase the risk of ectopic pregnancy. These risk factors share a common mechanism of action, namely, interference with fallopian tube function. Normally, an egg is fertilized in the fallopian tube and then travels down the tube to the implantation site. Any mechanism that interferes with the normal function of the fallopian tube during this process increases the risk of ectopic pregnancy. The mechanism can be anatomic (e.g., scarring that blocks transport of the egg) or functional (e.g., impaired tubal mobility). Among the many risk factors, a previous pelvic infection and assisted reproductive techniques offers the most logical explanation for the increase in frequency of ectopic pregnancies

today. However, most patients have no identifiable risk factors (3,13).

5.1 Pelvic Inflammatory Disease (PID)

PID is an inflammation of the uterus, fallopian tubes and/or ovaries. It can cause scarring, which later cause serious complications, including chronic pelvic pain, infertility, adhesions and ectopic pregnancy. 50 % of women that acquires PID are not aware of it. This leads to a chronic inflammation that can do much damage before being discovered (13). In the United States, more than a million women are affected by PID each month, and the rate is highest with teenagers and first time mothers. *N. gonorrhoea* is isolated in 40-60% of women with acute salpingitis. *C. trachomatis* is estimated to be the cause in about 60% of cases of salpingitis, which may lead to PID (14). Salpingitis increases the risk of ectopic pregnancy to as many as four times (13). A published study of 745 women whom attempted to get pregnant after one or more episodes of PID showed that 16% were infertile due to blocked tubes. Of those that conceived, 6.4% had ectopic pregnancies. (15)

5.2 History of Prior Ectopic Pregnancies or Pregnancy

A single prior ectopic pregnancy increases the likelihood 7- to 13-folds for having another one. Overall, after having one ectopic pregnancy there is a 50-80% chance of having a subsequent intrauterine gestation, and a 10-25% risk of having a future tubal pregnancy(3,13).

5.3 History of Tubal Surgery and Conception after Tubal Ligation

Records have shown that tubal surgery increases the risk of ectopic pregnancy. This depends though, on the degree of damage that occurred during surgery (3,13). The procedures associated with increased risk include salpingostomy, neosalpingostomy, fimbrioplasty, tubal reanastomosis and lysis of peritubal or periovarian adhesions. Reports shows that pregnancy after tubal ligation raises the risk of ectopic gestation to 35-50%. Incidence is higher 2 or more years after sterilization rather than immediately after the procedure (13).

5.4 Fertility Drugs and Assisted Reproductive Techniques

In a case-control study on ovulation induction with clomiphene citrate or injectable gonadotropin therapy, it was shown to cause a 4-fold increase in the risk of ectopic pregnancy. This finding suggests that multiple eggs and high hormone levels may be significant risk factors. On the other hand, the use of assisted reproductive techniques can increase the risk of ectopic pregnancy including heterotopic pregnancies. Heterotopic pregnancies are the pregnancies occurring simultaneously in different body sites. Examples of these techniques are in vitro fertilization and gamete intrafallopian transfer. This was the conclusion of a study of 300 clinical pregnancies that underwent IVF, in which ectopic pregnancy rate was 4.5%. The study showed that pregnancies achieved through IVF or gamete intrafallopian transfer can result in heterotopic gestation at 1% compared to 1 out of 30,000 pregnancies from normal spontaneous conceptions (13).

5.5 Use of Intrauterine contraceptive devices (IUD)

The presence of this device has always been suspected as a risk factor of ectopic pregnancy (3,13). The modern IUD does not entail this risk, and no evidence suggests that currently available IUDs cause pelvic inflammatory disease. One explanation for the mistaken association of IUDs with ectopic pregnancy may be that when an IUD is present, ectopic pregnancy occurs more often than intrauterine pregnancy. The risk of having an ectopic pregnancy with a IUD accounts for 3-4%(3,13).

5.6 Increasing Age

Ectopic pregnancy occurs mostly in women aged 35-44 years. These women have a three-to-four times higher risk than those aged 15-24(3). The myoelectrical activity in the fallopian tube responsible for tubal motility may slow down with age and be the cause of leading to abnormal implantation (13).

5.7 Smoking

Cigarette smoking has a dose-related effect on the risk of ectopic pregnancy. Studies have shown an elevated risk of ectopic pregnancy at 1.6 to 3.5

times among smokers as compared to non-smokers(13).Cigarette smoking is known to affect ciliary action in the nasopharynx and respiratory tract. A similar effect may occur within the fallopian tube. Research on both human and animal subjects identified several mechanisms by which smoking contributes to ectopic pregnancies. These included not only altered tubal and uterine motility but also delayed ovulation and altered immunity (3).

5.8 Salpingitis Isthmica Nodosa

Salpingitis Isthmica Nodosa is defined as the presence of tubal epithelium in the myosalpinx or beneath the tubal serosa. These pockets of epithelium protrude through the tube, similar to small diverticula (13). Studies of the fallopian tubes of 50% of patients who underwent salpingectomy for ectopic pregnancy had these microscopic pockets. Their origin or cause is not clear. They are thought to be both congenital and aquired by inflammatory tubal alterations (13).

5.9 Other Risk Factors

These include in utero exposure to diethylstilbestrol (DES), a T-shaped uterus, previous abdominal surgery ie ruptured appendix and failure of progesteron-contraceptive pills(13). Multiple sexual partners, early age at first intercourse and vaginal douching are also often considered risk factors for ectopic pregnancy. The mechanism of action for these risk factors is indirect, in that they are markers for the development of sexually transmitted disease, ascending infection, or both.(3)

6. Clinical presentation

Quite often, there will be no symptoms suspecting an ectopic pregnancy (10). Instead, they report symptoms common to early pregnancy, such as a missed period, breast tenderness, nausea and fatigue. A pregnancy test will yield positive results. Only about 50% of all patients display the typical symptoms of ectopic pregnancy, usually occurring six to eight weeks after the last normal menstrual period. The hallmark being abdominal pain with spotting or light

bleeding(13). Physical findings of an ectopic pregnancy include a normal or slightly enlarged uterus, pelvic pain with movement of the cervix and a palpable adnexal mass. Findings such as hypotension and marked abdominal tenderness with guarding and rebound tenderness suggest a leaking or ruptured ectopic pregnancy(13).

When the site ruptures and bleeds, symptoms include dizziness or fainting, pain radiating to the shoulder area and sharp and sudden pain in the lower abdomen. These patients may be hemodynamically compromised and need prompt diagnosis and treatment. The findings of severe hypotension or shock comprises 20% of the clinical presentation of ectopic pregnancies. Rapid hemorrhage is more common in cornual ectopic pregnancies (3). Modern diagnostic techniques can now diagnose most ectopic pregnancies before rupturing (13).

7. Diagnosis

Compared to the other forms of early pregnancy disorders, there is no pathognomonic pain or findings on clinical examination that are diagnostic of a developing ectopic pregnancy (17). Many ectopic pregnancies are misdiagnosed at the initial visit to an emergency department. Failure to identify risk factors is cited as a common and significant reason for misdiagnosis. A proper history and physical examination remains essential for initiating an appropriate work-up that will result in the accurate and timely diagnosis of an ectopic pregnancy(16). Screening algorithms incorporating plasma hCG and transvaginal sonography have allowed a less invasive evaluation of the patient with suspected ectopic pregnancy (9). hCG levels and US findings must be interpreted together. An important parameter is the discriminatory hCG level above which the gestational sac of an intrauterine pregnancy should be detectable, usually 1000iu/L. The presence or absence of an intrauterine gestational sac is the principle point of distinction between ectopic and intrauterine pregnancy. The sonographic finding of an extrauterine sac with an embryo or its remnants is the most reliable diagnosis of ectopic pregnancy. The presence of fluid in the pouch of Douglas is a non-specific sign (7).

Laparoscopy and uterine curettage have traditionally been the gold standard to verify the diagnosis of ectopic pregnancy. Today a laparoscopy should be considered in women with hCG above the discriminatory level and absence of an intrauterine pregnancy on ultrasound (3). Culdoscentesis for excluding hemoperitoneum has also been a routine investigation in the emergency rooms, but because the test is based on the late development in the natural history of the ectopic pregnancy, it is not useful in early diagnosis and is obsolete today (17). Differential diagnosis of ectopic pregnancy should always be kept in mind and includes appendicitis, ruptured ovarian follicle or luteal cyst, spontaneous or threatened abortion, ovarian torsion, and urinary tract disease (13).

8. Treatment

Once an ectopic pregnancy has been diagnosed, the patient should be reevaluated clinically. Expectant or medical management may be attempted if the patient remains stable and is reliable. If the patient's condition deteriorates, surgical management is indicated (13).

8.1 Expectant Management

Expectant management is based on the assumption that a significant proportion of all tubal pregnancies will resolve without any treatment. Not all patients are suitable for this type of treatment or for a simple follow up, and strict criteria must be observed in the selection of patients. Ultrasound examinations combined with serial hCG assessments are prerequisites for successful expectant management (17).

8.2 Medical therapy

Medical therapy has become the alternative approach for ectopic pregnancy instead of surgical removal for a number of reasons, including eliminating morbidity from surgery and general anesthesia, potentially less tubal damage, and less cost and need for hospitalization (13). Therapeutic approaches such as local injection of prostaglandins, potassium chloride, hyperosmolar

glucose or methotrexate are used to induce abortion (8). Methotrexate is a folic acid analog that interferes with DNA synthesis. It can be given as a single or multiple injections. It has a high success rate of 88-92% and even higher on patients with relatively low hCG levels (8). The β -hCG level needs to be considered in selecting patients for methotrexate therapy. One study found that β -hCG levels higher than 1,500 mIU per mL are associated with a much higher risk of treatment failure. Patient factors must also be considered. The patient must be dependable, compliant and capable of following up. The gestation should not be more than 3.5 cm by ultrasound measurement. There should be no contraindications for using methotrexate and blood and liver tests must be taken. (13). Failure of use can lead to tubal rupture, which requires surgery. The patient should be informed about the signs and symptoms of tubal rupture and should be instructed to contact the physician in case of symptoms as abdominal pain or heavy vaginal bleeding (13).

8.3 Surgery

Previously, salpingectomy by laparotomy was the gold standard for the treatment of ectopic pregnancy. The laparoscopy has virtually eliminated the need for laparotomy. Currently, laparotomy is the preferred technique when the patient is hemodynamically unstable, the surgeon has not been trained in laparoscopy, physical facilities and supplies to perform laparoscopic surgery are lacking or technical barriers to laparoscopy are present.

Salpingectomy is the choice for patients who no longer wants to be fertile, had previous ectopic pregnancy in the same tube or has severely damaged tubes (13). The most frequent complications of conservative surgery are recurrence of ectopic pregnancy (incidence ranging from 5 to 20 percent) and incomplete removal of trophoblastic tissue.(17)

Regardless of the treatment approach, except after salpingectomy, the β -hCG level should be followed until it becomes undetectable or decreases to less than 5 mIU per mL to ensure that treatment is complete(13)

9. Contraindications

9.1 Medical therapy

Medical treatment is contraindicated when b hCG level is higher than 3500 IU/L, fetal heart activity and free fluid is found in the cul-de-sac.

Contraindications include also hypersensitivity to methotrexate, renal, hepatic or hematologic dysfunction(13).

9.2 Surgical therapy

Surgical treatment when the pregnancy is located at the cervix, ovary, or in the interstitial/cornual portion of the tube is often associated with increased risk of hemorrhage, often resulting in hysterectomy or oophorectomy. In these cases, treatment with methotrexate is especially attractive. But in case of uncontrolled bleeding and hemodynamic instability, radical surgery is favoured (13).

10. Prognosis

Most women who had a single ectopic pregnancy are able to have normal pregnancies afterwards. The rate of infertility after an ectopic pregnancy is 10-15 %(3). It depends upon several factors, the most important among them is a prior history of infertility. The treatment choice, whether surgical or nonsurgical, also plays a role. For example, the rate of intrauterine pregnancy may be higher following methotrexate compared to surgical treatment. Fertility rate following salpingostomy is better than salpingectomy. A recurrence of ectopic pregnancy is seen to be 10-20%(3).

11. Smoking as a risk factor for ectopic pregnancy

11.1 The Perils of Smoking

Tobacco smoke consists of more than 4,000 chemicals, most of them toxins and carcinogens. Some of these are nicotine, tar, polycyclic aromatic hydrocarbons, metals, carbon monoxide, arsenic and hydrogen cyanide.

These agents are related to many diseases and disease states. Other contents still have to be identified. Health care professionals have called massive attention to

the danger of active and passive smoking. Both types of smoking have been linked to leading causes of death, such as cardiovascular disease, cancer and chronic lung disease. Present data offer enough evidence on the huge impact of smoking on public health. It not only poses great threat to life and health but also cause great medical expenses and indirect costs on all resources. Many studies has shown that smoking affects fertility. Women and men smokers face the same health concerns but there are less known health risks women smokers contend with (4).

A recent survey in USA conducted among women health care workers on their awareness of the negative impact of smoking, revealed that 95-99% of them were aware about it`s connection to certain diseases. But only 39% of them connected smoking with miscarriage, and fewer connected smoking with ectopic pregnancy, infertility, early menopause and osteoporosis.

A secondary analysis of the 1995 National Survey of Family Growth in U.S among 824 women-respondents identified factors indirectly relating to infertility. These included current smoking, increasing age, previous ectopic pregnancy, obesity and health status. Other studies pointed to active smoking by either partner as a factor for causing delayed conception.

If the woman is the smoker it`s a 54% that the delay will be greater than 12 months (4).

Every cigarette box carries the surgeon`s general warning about smoking and adverse effects on pregnancy, yet both pregnant women and those planning to continue to ignore it.

Some studies sought to establish the toxicity of the long-acting metabolite of nicotine and it`s effect on the complex process of conception. With the achievements in the field of in vitro fertilization, the process could be observed in every stage. And every stage is a potential stage for assault by toxic and mutagenic compounds from tobacco smoke.(4) This could be a way to explore the harmful effects of smoking.

11.2 Odds Higher among Heavy Smokers

A population-based study made in central France with 803 women-respondents having had an ectopic pregnancy, identified heavy smoking and a history of sexually transmitted disease as main risk factors.(5). Those who smoked 20 or more cigarette sticks a day had four times the likelihood of having an ectopic pregnancy than those who never smoked. On the other hand, those with a history of sexually transmitted disease or confirmed pelvic inflammatory disease ran the risk three times more than those without. Each factor accounted for almost one-third of ectopic pregnancies (5). They were using the information gathered from an ectopic pregnancy register established in Auvergne 1992. 803 women, aged 15-44, who were treated for ectopic pregnancy at a health care setting between 1993 and 2000 were studied(5). The researchers analyzed the respondent's risk of ectopic pregnancy by obtaining and assessing their background characteristics; surgical, gynecologic and obstetric history, history of STD and its risk factors, the use of contraceptives and other characteristics related to fertility. Results showed a strong relationship between smoking and ectopic pregnancy. Women who smoked had a 50% higher risk than those who never smoked. The risk was greater with those who smoked at the time of the study and increased with the number of cigarette sticks smoked daily. Those who smoked 20 or more cigarettes were 3.9 times more at risk than those who never smoked (5). The study also showed that the risk of ectopic pregnancy increases with advancing age. Those in the late 30s incurred a 40% higher risk than those in their late 20s. Women in their 40's or older was shown have three times the risk of those aged 25-29.

Other risk factors are previous termination of pregnancy and use of IUD (5). All the factors combined accounted for 76% of all recorded ectopic pregnancies. Smoking, and STD history together with a history of tubal surgery, would constituted 35% and 33%, respectively. The other factors would account for 18% or fewer of ectopic cases. The researchers concluded that increasing awareness of the role of smoking and STD in public health should be fundamental in formulating ectopic pregnancy prevention policies (5).

11.3 Smoking-Related Ectopic Pregnancies on the Rise in the Western World

Ectopic pregnancy has become more frequent in the Western world in the last two or three decades. The incidence in the United States was 19.7 per 1000 reported pregnancies in 1992. This was three times higher than the incidence in 1917. In comparison 1200-1500 women are hospitalized in Norway every year for ectopic pregnancy. A study conducted on Hordaland County in Norway, showed an increase in incidence from 11.2 in 1976-81 to 18 in 1988-93. Some hospitals consider this increase in incidence as an epidemic (1)

A population-based study conducted with 9,237 hospitalized Norwegian women from 1991-1997 pointed to a link between smoking and increased risk of ectopic pregnancy (1). It also decreases fertility and increases risks of complications. These complications include abortion, placental rupture, low birth weight, perinatal death and SIDS. The women respondents were aged 35-49, chosen randomly from the national registry to answer questions about their pregnancy, smoking habits and use of birth control. 15,000 questionnaires were distributed. Two out of 3 were current or previous smokers. The study showed that the total, 301 or 3.3% had an ectopic pregnancy which is a 50% higher chance among smokers than among non-smokers.(1).The study also yielded some highlights. It found the strongest association between smoking and ectopic pregnancy among women without previous children. With a 32% risk, the overall conclusion was that 1/3 of ectopic pregnancies could have been prevented if the women were not smoking(1).

Overall findings from the population based study in Norway, support the hypothesis that smoking increases the risk of ectopic pregnancy (1). The study, however, cannot indicate how significant the the increased risk is because no questions was made about when the women smoked. Others can provide statistical evidence on that increase. One study was a clinical case-controll study conducted in Georgia, USA from 1988-90. They included women that only smoked at the time of conception. Certain adjustments on age, previous surgical procedures, infertility and parity were made. They found a 95% higher probability for ectopic pregnancy among women who smoked during the peri-conception period compared with women who did not smoke (1).

These studies, therefore, offers strong evidence of the association between smoking and the increased risk of ectopic pregnancy. (1).

12. Prevention

You can't prevent an ectopic pregnancy, but you can decrease certain risk factors (11.)The most common etiology of ectopic pregnancy is Pelvic inflammatory disease or PID. It is a common complication of cervicitis. PID, can develop without clinical findings to suggest it. Hence, silent or atypical PID accounts for many cases of tubal factor infertility and tubal pregnancy. With *C trachomatis* and *Neisseria gonorrhoea* as the most common sexually transmitted pathogens and a major causes of PID, efforts should be set in preventing these infections (11). Suspect cases should therefore be tested, in particular to prevent the long-term consequences of PID. STD prevention should include diagnostic services with proper quality control, clinician guidelines in diagnosing and managing cervicitis, screening asymptomatic carriers , surveillance systems, health care training, periodic monitoring and evaluation of control measures and routine tests of sex partners. Effective patient education on behavioral aspects and contraception including number of sex partners and use a condom are also important measures for prevention. Besides STD, smoking is thought to be a major risk factors for ectopic pregnancy. Many studies has been done the last years to proove this hypothesis, with reliable resaults. It is therefore important to spread this knowledge to women in fertile age. They should not only be aware of the increased risk of ectopic preganacy, but also the effect of smoking on fertillity and pregnancy.

Prevention of ectopic pregnancy can be primary, secondary, or tertiary.

12. 1 Primary prevention

Primary prevention includes avoiding exposure to STD through lifestyle counseling and health education. Clinicians should ask questions about patient's high-risk sexual behavior, encourage her and her partner or partners to be tested if at risk, and secure treatment if infected. Counselling about safe sex practices

should follow. Primary prevention of sexually transmitted disease through health education has not proved to be effective. Health education is slow and quite complicated to implement (11). Yet health education is needed, especially among adolescents.

Smoking is known to be the cause of many serious diseases, but not all women know that it has an adverse effect on pregnancy. Health education is an important preventive measure and should be emphasised. Not only can the clinician provide counseling, but teachers and school nurses should be encouraged to provide education about these dangers due to smoking. This can help young girls understand in an early age.

12. 2 Secondary prevention

Secondary prevention is conducted through universal screening in order to prevent PID and its long-term consequences, including ectopic pregnancy. Part of secondary prevention is the early detection of sub-clinical disease through specific tests. This is to prevent lower genital tract infections from becoming upper genital infections. A recent and randomized controlled trial offered strong evidence that the selective screening tests for Chlamydial infections could reduce the incidence of PID. The tests included a single-dose therapy of azithromycin, amplification tests, and the first-void urine specimens for the diagnosis (11). But whether the result of the screening would significantly impact the incidence of ectopic pregnancies and tubal factor infertility remained uncertain.

When it comes to smoking, secondary prevention is made by identifying those who smoke and to help them stop smoking. If the woman or girl is planning to get pregnant, it is important that a clinician make sure they understand the dangers of smoking. If the patient wants the help to quit smoking, the clinician can make a structured plan that includes counselling during the process of quitting which is known to be hard. Possible medical treatment with nicotine replacement drugs can be prescribed if the woman is unable to stop before or during pregnancy. Antidepressive drugs as Bupropion should not be used during pregnancy (18)

12.3 Tertiary prevention

Tertiary prevention of acute and chronic STD of the upper genital tract and smoking, however, fails. Significant tubal damage has already occurred when symptoms begin to surface. Delay of care is also an important factor predicting tubal damage. In case of STD the risk remains high for tubal-factor infertility or ectopic pregnancy despite the patient's response to antimicrobial therapy (11).

13. Conclusion

The purpose of this paper was to explore the possibility that smoking may increase the incidence of ectopic pregnancy. Studying the results from research done in France, the United States and Norway, shows that smoking is associated with an increased risk of ectopic pregnancy, and can be a contributing factor to the higher incidence too. Up to 1/3 of ectopic pregnancies could have been prevented if the women had not smoked. In addition, smoking leads to decreased fertility and increased risk of other complications in pregnancy. Sexually transmitted diseases are also a major factor that is shown to increase the incidence of ectopic pregnancy.

Raising awareness of the role of smoking and sexually transmitted diseases in public health should be fundamental in formulating ectopic pregnancy prevention policies. Advise about smoking cessation for women at a fertile age is effective, and should be emphasized more in preventative measures in the primary care setting

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