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Long-term sequelae of pelvic inflammatory diseases

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SUMMARY

The aim of the study was to assess the long-term sequelae of pelvic inflammatory diseases amongst females living in the Southern Ukraine region.

The most common sequela of PID was chronic pelvic pain (24.4% in 12 months after treatment, 69.2% - in 24 months, 80.0% - in 36 months). No cases of eutopic pregnancies were recorded during all follow-up period but 3 (4.0%) cases of ectopic pregnancies were recorded. 4 patients experienced recurrent PID episodes during this period.

The long term sequelae of PID were associated with severe disease, delay in treatment and recurrent infection. Thus early diagnosis and intervention in the cases of acute PID are drastically important for the prevention of further long-term sequelae. When considering preventive strategies, prevention of recurrent PID is an important goal as it has been shown that the sequelae of PID could be worsened with repeated episodes of PID.

Key words: pelvic inflammatory disease, sequelae, reproductive health

Pelvic inflammatory disease (PID) remains one of the major health issues adversely affecting women worldwide. Not only are there substantial medical and economic costs attributable to acute illness but long-term sequelae as tubal factor infertility, ectopic pregnancy and chronic pelvic pain also create an even greater health burden and cost [1, 4, 5].

The highest risk of PID is associated with promiscuity, poor contraception culture and sexual hygiene and young age especially when patient's residency place is in the area with a high prevalence of sexually transmitted disease (STD) [4, 5].

PID etiology is related to urogenital infection, in some cases infection and inflammation could affect not only pelvic but also perihepatic structures (Fitz-Hugh–Curtis' syndrome). *Chlamydia trachomatis* plays main role in PID occurrence however other microorganisms (*Neisseria gonorrhoeae*, *Gardnerella vaginalis*, *Haemophilus influenzae*, *Peptococcus spp.*, *Bacteroides spp.*) could be implicated in the pathogenesis of PID. Clinical studies has demonstrated that in 30-40% of cases, PID has polymicrobial etiology [3, 5]

The annual rate of PID in high-income countries has been reported to be as high as 10-20 per 1000 women of reproductive age. Public health programs for reducing STDs have been quite effective in diminishing the incidence of PID [1, 5, 6].

When considering the following data regarding the sequelae of PID, it is important to note whether the patient population was diagnosed clinically and surgically. In older studies ultrasound and microbiological testing was not as advanced therefore laparoscopy was used to confirm the diagnosis. Now, less invasive and therefore less-accurate clinical diagnostic tools are used [1, 5]. Unfortunately the majority of clinical and laboratory criteria used traditionally to judge the clinical severity of acute PID only partially predict the degree of tubal and other pelvic damage on laparoscopy and are not reliable in assessing an individual patient's future risk of adverse sequelae. In women whose fallopian tubes are damaged by a previous infection, endogenous microorganisms from the vagina can cause a primary infection or reactivation of a latent tubal infection. Thus, after an initial urogenital infection irreversible tubal damage can occur, causing subsequent absolute infertility, relative infertility leading to ectopic pregnancy and/or chronic pelvic pain [1, 4, 5].

The aim of the study was to assess the long-term sequelae of pelvic inflammatory diseases amongst females living in the Southern Ukraine region.

Material & Methods.

The research was done at the municipal hospital No 1 (Odessa, Ukraine) during 2010-2015. The analysis of clinical outcomes in 200 women with verified PID. The criteria include: the presence of PID, exclusion criteria: acute stroke, acute myocardial infarction and other urgent states, diffuse peritonitis, multiple organ failure, mental illness, systemic collagenosis, acute respiratory infections, tuberculosis and other chronic infections, psoriasis, atopic dermatitis.

Clinical management of patients conducted by the MOH Ukraine of 29.12.2003 № 620 p., Number 676 of 31.12.2004. "On approval of clinical protocols for obstetric and gynecological care".

All women held bimanual pelvic study, conducted research General and biochemical parameters, ultrasonographic examination of the pelvis on the unit Siemens Acuson X150 (Germany) by standard methods.

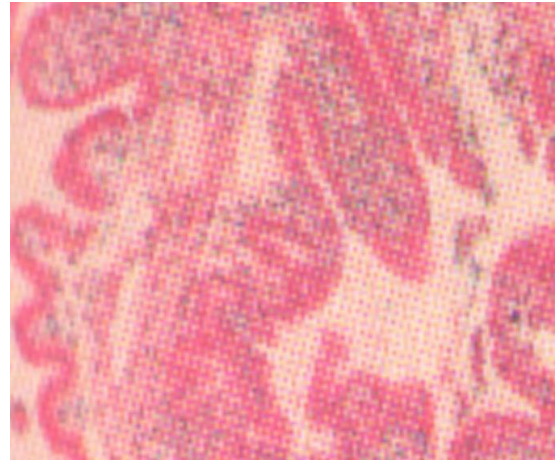
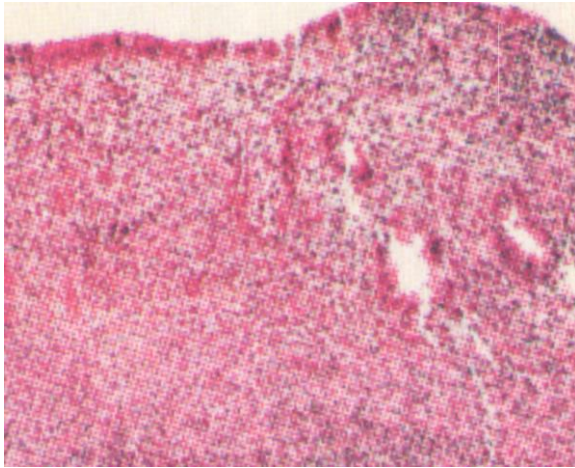
All examinations were carried out after signing consent forms for patients to participate in the study and designed accordingly to the current bioethical requirements of the Helsinki Declaration of 1975 and its revision in 1983.

The follow-up period for the assessment of long-term sequelae was 12-36 months dependently on the time of patient's inclusion in the study. All cases of hospitalization and other SAE were recorded. Data were collected using phone-survey accordingly to the methodic described by Dash J et al. (2016) [2].

Statistical analysis was performed with the assessment of operational performance diagnostic test using the software Statistica 13.0 (Dell StatSoft Inc., USA). The critical level of significance when testing statistical hypotheses in this study was used as equal to 0.05

Results.

The average age of patients was $37,4 \pm 0,8$ years. There were recorded cases of piosalpinx with perforations (42.6%) and tuboovarian abscess (TOA) (28.0%). Other PID were represented by pelvic abscesses -12 cases (16.0%) and purulent salpingoophoritis - 10 cases (13.3%). Appropriate pathomorphological examination was used for approving diagnosis (Fig. 1).



a)

b)

Fig. 1 Patient C., 36 y.o. Acute pelvic inflammatory disease (a – endometrium, b – Fallopian tube) x20

At this example the endometrial stroma contained an inflammatory infiltrate that consists primarily of polymorphonuclear leukocytes, the superficial layer of the endometrium and the stroma were permeated by numerous leukocytes. The fallopian tube mucosal folds were characterized with inflammatory infiltrate with the submucosa consistent with acute salpingitis.

At the time of treatment patients had stereotypical complaints: pain in the abdomen, fever, weakness, dry mouth and other symptoms of intoxication. In patients with TOA showed signs of peritonitis or symptoms of peritoneal irritation. In these patients occurred following concomitant diseases: secondary appendicitis (2 cases or 9.5%), uterine fibroids (7 patients - 33.3%), uterine cancer (1 patient - 4.8%). All patients in the first two days undergoing various transaction volumes (hysterectomy, supravaginal uterus amputation, adnexectomy, tubectomy). Postoperative complications were observed in 16 (76.2%) patients in the form of manifestation of wound infection, hyperthermia. In one of the patients had differences seams on postoperative wound infiltration with subsequent postoperative scar wound healing by secondary intention.

If piosalpinx with perforations were observed in patients with pronounced signs of intoxication, pelvioperitonitis symptoms were detected.

Comorbidities included secondary appendicitis (1 patient - 3.6%), uterine fibroids (4 patients - 14.3%), colorectal cancer (2 patients - 7.1%), pelvic adhesions (3 patients - 10.7%).

In 14 (50.0%) patients had fever in the postoperative period to 7 days. In 9 (32.1%) patients in this group were attached displays wound infection, one of the patients - systemic inflammatory response syndrome. In one of the patients on the background of postoperative complications was observed postoperative intestinal paresis, the restoration of motor function was held on the fifth day after surgery.

Postoperative complications were observed in six (60.0%) patients in the form of manifestation of wound infection, hyperthermia.

Phone survey was conducted during all follow-up period but only 49 (65.3%) patients responded in the first year, 26 (34.7%) – in the second year and only 10 (13.3%) – in the third year. The results of the survey are presented in the Table 1.

We can see that the most common sequela of PID is chronic pelvic pain (24.4% in 12 months after treatment, 69.2% - in 24 months, 80.0% - in 36 months). No cases of eutopic pregnancies were recorded during all follow-up period but 3 (4.0%) cases of ectopic pregnancies were recorded. 4 patients experienced recurrent PID episodes during this period.

Table 1. The sequelae of PID

Time	Pregnancy		Ectopic Pregnancy		Chronic pelvic pain		Recurrent PID	
	Abs.	%	Abs.	%	Abs.	%	Abs.	%
12 months (n=49)	-	-	-	-	12	24.4	2	4.1
24 months (n=26)	-	-	2	7.7	18	69.2	1	3.8
36 months (n=10)	-	-	1	10.0	8	80.0	1	10.0

The long term sequelae of PID were associated with severe disease, delay in treatment and recurrent infection. Thus early diagnosis and intervention in the cases of acute PID are drastically important for the prevention of further long-term sequelae. When considering preventive strategies, prevention of recurrent PID is an important goal as it has been shown that the sequelae of PID could be worsened with repeated episodes of PID.

Conclusion:

The long term sequelae of PID – infertility, ectopic pregnancy, chronic pelvic pain and recurrent PID episodes are common in the female population suffering from PID

The long term sequelae of PID are associated with severe disease, delay in treatment and recurrent infection.

References.

1. Brunham RC, Gottlieb SL, Paavonen J. Pelvic inflammatory disease. *N Engl J Med.* 2015 May 21;372(21):2039-48
2. Dash J, Haller DM, Sommer J, Junod Perron N. Use of email, cell phone and text message between patients and primary-care physicians: cross-sectional study in a French-speaking part of Switzerland. *BMC Health Serv Res.* 2016 Oct 5;16(1):549.
3. Haggerty CL, Totten PA, Tang G, Astete SG, Ferris MJ, Norori J, Bass DC, Martin DH, Taylor BD, Ness RB. Identification of novel microbes associated with pelvic inflammatory disease and infertility. *Sex Transm Infect.* 2016 Sep;92(6):441-6
4. Pelvic Inflammatory Disease / Suzanne Moore Shepherd, Michel E Rivlin Retrieved from: <http://emedicine.medscape.com/article/256448-overview>
5. Pelvic inflammatory disease. / ed. Richard L. Sweet, Harold C. Wiesenfeld Taylor & Francis, London-NY 2006 173 p.
6. Thakre SS, Dhakne SN, Thakre SB, Ughade SN. Hygiene practices and sexual activity associated with urinary tract infection in rural pregnant women of Nagpur, India. *Indian J Med Microbiol.* 2015 Jan-Mar;33(1):177-8.