STUDY REGARDING THE EVALUATION OF PATHOGEN FLORA AND THE APPEARANCE RISK OF NOSOCOMIAL INFECTIONS IN OBSTETRICS AND GYNECOLOGY

SUMMARY: The nosocomial infections are an actuality issue of the actual obstetrics. The supervision of the maternities from the nosocomial infections point of view is necessary due to their appearance risk, both in new-borns as well as in pregnant women who are extremely receptive at any microbian aggression due to the immunodepression of gestation. We expose a retrospective study from a period of 5 years, 2006-2010 regarding the analyse of the incidence of pathogen infections from 1018 probes from which 656 (64.44%) were surface probes, 202 (19.84%) were sterility probes and 160 probes for the study of the microflora. We analysed systematically the pathogen strain showed, negative-coagulazo staphilococcus (49.44%) and Staphylococcus aureus (28.88%) being the most frequent, Escherichia coli (31.88%), Klebsiella spp. (2.22%) and Pseudomonas aeruginosa 5.55% were also showed. The microflora probes were positive in 13.75% and the sterility probes in 1.98% cases. The results were in correlation with the incidence of the nosocomial infections which in the studied period ranges between 0.10-0.21%.

Keywords: obstetrics, pathogen flora, microaeroflora

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Correspondence to: S. Casiana, Department of Obstetrics and Gynecology, Clinical Emergency Hospital Timisoara, I.Bulbuca st. 10, Timisoara, RO

Stanescu Casiana¹, Gluhovschi A.¹, Munteanu I.¹, Anastasiu D.M.¹

1. - Department of Obstetrics and Gynecology, Neonatology and Puericulture, University Clinic of Obstetrics and Gynecology “Bega” Timisoara, University of Medicine and Pharmacy “Victor Babes” Timisoara
INTRODUCTION

The nosocomial infection is the infection acquired in the hospital or in any medical unit with beds and is due to the microorganisms. The disease is clinically or microbiologically known to affect the sick person in the hospitalization period or it can manifest during the ambulatory treatment after discharge, due to the activity of the sanitary staff, no matter if the symptoms of the disease appear or not while the sick person is or not in the hospital (1-5).

For the infection to be considered nosocomial there must be the proof that it was not present or in the incubation period in the moment of patient admission in the hospital (5, 6, 7).

The hospital suppuration appeared once with the appearance of the hospitals and it changed during the evolution in time depending on the contributing factors, on the antibiotics development and on the increase of the resistance to antibiotics (11, 13).

Lenette (10) and Licker (5) showed that the nosocomial infection represents an important cause of child mortality influencing the index of infantile mortality, their incidence depending on their age and on the presence of risk factors.

Leigh (8) considers that the new born infections can be the result of the intrauterine pathology and of the ascension of the infection after amniotic membrane rupture and can appear during the deliverance by the expose of the new born to the infection sources present in the hospital atmosphere.

Due to the difficulties of establishing the etiology of the nosocomial infection, The National Centre of Supervision of Nosocomial Infections in USA (NNIS) considers being nosocomial any infection appeared in the first 28 days of life of the new born.

The nosocomial infection can be gained as a consequence of the use of some diagnostic methods for therapeutic procedures or even through the simple display of the patient to the hospital microclimate or to the contact with the medical staff.

The supervision of the maternities from the nosocomial infections point of view is necessary due to the risk of appearance of those both in new born as well as in pregnant women who are very receptive at any aggression due to the immunodepression of gestation.

NNIS reports a percentage of 1.4% of nosocomial infections with variations between 0.9-1.7%, the patients from the neonatology and intensive care being exposed to the hospital environment, both in the birth rooms, in the maternity salon, as well as in the neonatology department with a double risk of contacting the nosocomial infection.

This aspect imposes a careful supervision of the maternities from the nosocomial infections point of view and adapting prophylactic measures of prevention. Obstetrics has an important role in the history of nosocomial infections starting with Semmelweiss and Pasteur who wanted to reduce the puerperal fever, the main cause of the maternal mortality (14, 15, 19).

After Licker (11) the repartition, on departments, of the 311 positive probes from a maternity has the following structure:

<table>
<thead>
<tr>
<th>Department</th>
<th>Probes</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outpatient Clinic</td>
<td>36</td>
<td>11.57%</td>
</tr>
<tr>
<td>Intensive care</td>
<td>9</td>
<td>2.89%</td>
</tr>
<tr>
<td>Gynecology</td>
<td>103</td>
<td>33.11%</td>
</tr>
<tr>
<td>Obstetrics</td>
<td>99</td>
<td>31.83%</td>
</tr>
<tr>
<td>Birth rooms</td>
<td>47</td>
<td>15.11%</td>
</tr>
<tr>
<td>Medical staff</td>
<td>17</td>
<td>5.46%</td>
</tr>
<tr>
<td>Total</td>
<td>311</td>
<td>100%</td>
</tr>
</tbody>
</table>

MATERIAL AND METHOD

We performed a retrospective study in a period of 5 years 2006-2010 of the main results of the investigations performed by the epidemiological nucleus of the clinic and to our request of some investigations performed by the Microbiology Department of the University, in the end we analysed the results of 1018 probes from which: 656 surface probes (63.81%), 202 sterility probes (19.64%) and 100 probes for the study of the microaeroflora (16.53%). From these, 167 were positive probes (89.30%) from the surface probes 0.53% sterility control 1 case and 19 – control of the microaeroflora (10.16%).
Table 1. Positive probes at the epidemiological investigation

<table>
<thead>
<tr>
<th>Type</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nr</td>
<td>%</td>
<td>Nr</td>
<td>%</td>
<td>Nr</td>
<td>%</td>
</tr>
<tr>
<td>Surface probes</td>
<td>38</td>
<td>22.75</td>
<td>17</td>
<td>10.17</td>
<td>76</td>
<td>45.50</td>
</tr>
<tr>
<td>Sterilites</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>100</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Microaeroflora</td>
<td>13</td>
<td>68.42</td>
<td>2</td>
<td>10.52</td>
<td>2</td>
<td>10.52</td>
</tr>
<tr>
<td>Total positive probes</td>
<td>51</td>
<td>27.77</td>
<td>20</td>
<td>10.69</td>
<td>78</td>
<td>41.71</td>
</tr>
</tbody>
</table>

Table 2. Number of epidemiological investigations performed/year

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nr</td>
<td>%</td>
<td>Nr</td>
<td>%</td>
<td>Nr</td>
<td>%</td>
</tr>
<tr>
<td>2006</td>
<td>9</td>
<td>12.5</td>
<td>11</td>
<td>15.27</td>
<td>17</td>
<td>23.61</td>
</tr>
</tbody>
</table>

Fig. 1. Number of epidemiological investigations performed/year
In the positive microaeroflora probes from the studied group we identified 22 cases of hemolytic germs (13.75%) and only 1 case of fungi and 1092 germs/cm$^2$ in the air filter from an incubator from the newborn department.

In the case of sterility probes we perform a microbiological control of the sterilization and the sterility by harvesting the instruments which were sterilized.

From the 202 probes of sterility harvested, which represented 19.64% from the total number of harvested probes, 4 (1.98%) were positive probes, showing cereus bacillus in 3 cases and epidermidis staphylococcus in 1 case.

For the microaeroflora we harvested a total number of 160 (15.71%) probes constantly divided on years. From the 656 surface probes harvested from different objects and furniture, 180 were positive with pathogen flora in high quantity 0.1 germs/cm$^2$ representing 27.43% (Table 5.)

From the positive surface probes, we noticed the incidence of 5.55% with Pseudomonas aeruginosa. Patients hospitalized longer than 1 week and patients with antibiotherapy with large spectrum have a high risk of contamination with it.
In this context, the treatment of infections with piocianic bacillus requires an association of antibiotics because it can be the case of resistant strain.

Another germ gram negative non-fermentative isolated in 4 cases is Acinetobacter spp 2.22%, germs strictly aerob and can be involved in the etiology of some severe nosocomial infections. The Holland authors showed that Acinetobacter is spreading faster in hospitals.

From the negative gram germs from the family of enterobacteriaceae, Escherichia coli represents 3.88% from the entire group, although usually in maternities this is the most isolated germ 92.5% from the urinary infections and the asimptomatic bacteriuria being generated by it.

The second negative gram germ, Klebsiella, was isolated in 2.22% - 4 cases – the wild strain of Klebsiella with the sensible phenotype represents 76.5% from the entire Klebsiella pneumoniae isolated in the hospital environment.

The most frequent in our studied group was Staphylococcus epidermidis in 49.44% cases and Staphylococcus aureus in 28.88% cases. The last one is one of the nesporulated germs and the most resistant in the environment. In the literature, the incidency with the Staphylococcus aureus infections in the hospital is appreciated to be 10-15%, similar with E. coli.

The sanitary norms for the surface probes are 0-3 germs, with the exception of pathogen staphylococcus, E. coli enteropathogen and Proteus for which the number of admitted germs is zero.

The microbiology control of the hygiene-sanitary conditions is made by studying the aeromicroflora from the hospital rooms, from the birth-rooms, operatory rooms, septic and aseptic rooms, roaming-in rooms, bandage rooms, etc. the sanitary norms do not admit the presence of pathogene flora in the hospital and treatment rooms.

**CONCLUSIONS:**

1. The double controls performed in the epidemiological control of the clinic and the control performed by the microbiology department showed an incidence of the pathogen germs in the limits of the literature.
2. The incidence of nosocomial infections found in the clinic ranged between 0.10-0.21% and is correlated with the pathogen flora.
3. A higher incidence than 0.10.1 pathogen germs/cm$^2$ was 18.36% - 187 positive probes from 1018. From these, 89.30% were surface probes, 0.53% sterility probes and 10.16% probes for detecting the microaeroflora.

4. The periodical epidemiological controls performed showed the favorable factors and the deficiencies that favor the appearance of the nosocomial infections.

5. The presence of an efficient system of supervision of the nosocomial potential and respecting the rate and the norms of disinfection reduced the incidence of nosocomial infections.

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