THE RISK OF GENITAL INFECTIONS IN WOMEN USING INTRAUTERINE DEVICE

O RISCO DE INFECÇÕES GENITAIS EM MULHERES USUÁRIAS DE DISPOSITIVO INTRAUTERINO

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ABSTRACT

Introduction: Intrauterine devices (IUDs) are widely used contraceptive methods that have a possible association with lower genital tract infections. **Objective:** To assess whether IUD is associated with genital tract infection and which pathogens cause it. **Methods:** Systematic review of studies in PubMed database, Highwire-Stanford, and Google Scholar using the following keywords: "cytology IUD," OR "IUD AND cytology" OR "cytology" OR "cytological techniques," OR "cytological AND techniques," OR "cell biology," OR "cell" and "biology". **Results:** Sixteen out of the 2,817 initial articles were selected using the inclusion criteria. On the basis of these studies, the microorganisms that can colonize the IUD, the main acute pelvic inflammatory disease occasioner is *Actinomyces spp*. There is a risk 14 times greater of the presence of *Actinomyces spp*. in IUD users than in non-users. However, there would be a higher apparent depuration of human papillomavirus (HPV) infection among copper T users. **Conclusion:** There is an association between the use of IUD and some genital infections such as bacterial vaginosis; however, more evidently associated with *Actinomyces spp*. There is a possible higher depuration of infection by HPV among copper T users.

Keywords: intrauterine devices; /cytology; reproductive tract infections.

RESUMO

Introduçao: Dispositivos intra-uterinos (DIU) são amplamente usados como método contraceptivo e têm uma possível associação com infecções do trato genital inferior. **Objetivo:** Avaliar se o uso de DIU está associado com infecções do trato genital e por quais patógenos. **Métodos:** Revisão sistemática de estudos dos bancos de dados PubMed, Highwire-Stanford e Google Scholar usando as seguintes palavras-chave: "*cytology* IUD" OR "IUD AND *cytology*" OR "*cytology*" OR "*cytological techniques*" OR "*cytological* AND *techniques*" OR "*cell biology*" OR "*cell* AND *biology*". **Resultados:** Foram encontrados inicialmente 2817 artigos e selecionados 16, que obedeciam os critérios de inclusão. Com base nestes estudos, o microorganismo associado ao uso de DIU e principal causa de doença inflamatória pélvica é o *Actinomyces spp*. Há risco 14 vezes maior de presença do *Actinomyces spp.* em usuárias de DIU em relação a não usuárias. No entanto, parece haver uma maior depuração aparente de infecção por Papilomavírus humano (HPV) entre usuárias de DIU de cobre. **Conclusão:** Há uma associação entre o uso de DIU e algumas infecções genitais, tal como vaginose bacteriana; no entanto, o agente mais evidentemente associado é o *Actinomyces spp*. Há uma possível maior depuração de infecção por HPV entre usuárias de DIU de cobre.

Palavras-chave: dispositivos intrauterinos; /citologia; infecções do sistema genital.

INTRODUCTION

Intrauterine devices (IUDs) are long-term contraceptive methods with high effectiveness. It is estimated that more than 80 million women are using them for contraception in the world[1,2]. There is no reliable statistical data in Brazil.

Surprisingly, there is a reference with a lower incidence of cervical cancer in women using IUDs, although human papillomavirus (HPV) infection is not decreased in relation to the general population[3].

However, the use of IUD seems to be associated with the increase in the risk of infection caused by other microorganisms, which might occur in the first 20 days after its insertion[1], or over time, especially in case of prolonged use[4-6]. The most frequent pathogens observed in the method's users are *Actinomyces ssp.*, *Prevotella spp*., and *Mycoplasma hominis*[2].

The characteristic of these microorganisms is the ability to colonize these devices forming biofilms, which consists of layers of bacteria joining the epithelial cells hosts in an organized manner, thereby creating an environment of microbiome imbalance which might reach the upper genital tract[2]. The prolonged use of IUD can also cause the imbalance in the vaginal bacterial flora, enabling the proliferation of anaerobic microorganisms as *Gardnerella vaginalis*, predisposing to the emergence of bacterial vaginosis[7,8].

OBJECTIVE

Evaluate the reports published in recent years on the association of the use of IUD with genital infections through a systematic review.

METHODS

A systematic review of studies was carried out in PubMed database, Highwire-Stanford and Google Scholar using the following keywords: "cytology IUD," or "IUD" and "cytology" or "cytology," or "cytological techniques," or "cytological" and "techniques," or "cell biology," or "cell" and "biology".

Only those reports in English, Spanish, and Portuguese which had summaries, and considered infections associated with the use of the IUD published between 2002 and 2015, were taken into account. After selection, the works evaluated were those found to present a greater relevance considering the level of recommendation and strength of evidence suggested by the publication of the Brazilian Medical Association.

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RESULTS

Sixteen out of the 2,817 initial articles were selected, thus meeting the inclusion criteria for reading. In general, the presence of microorganisms in the female genital tract can cause pelvic inflammatory disease (PID). Among the microorganisms that can colonize the IUD, the main cause of acute PID is the *Actinomyces spp*.[9], and the predominant species found is the *Actinomyces israelii*[6,10].

DISCUSSION

Actinomyces are Gram-positive anaerobic non-spore-forming bacteria that can be pathogenic or commensal. In the oropharynx and in the gastrointestinal tract, bacteria are commonly commensal; however, a pathogenicity occurs when they are present in the genital tract[5].The favorable environment to anaerobes can be established inside the vagina, facilitating the growth of *Actinomyce ssp*.[11]. Moreover, IUDs are associated with infections because they significantly change the components of glycosaminoglycans of the cervical mucus, which protects the female genital tract from infections[12].

To colonize the IUD, bacteria can form biofilms, which consist of layers of host cells and bacteria soaked in a matrix consisting of a layer of exopoly saccharide responsible for the infection characterization[2]. Biofilm bacteria are usually resistant to antimicrobials, which makes the treatment of infected women more difficult, especially if the removal of the IUD is not carried out[2]. In addition, the removal of the device should be recommended, although the frequency of pelvic action mycosis is extremely low, and if it occurs, can be fatal[11]. Thus, it is important that the clinician has notion that beyond the use of antibiotics is important for the removal of the IUD for effective treatment.

In the genital tract, these bacteria promote pelvic action mycosis, granulomatouschronic infection characterized by the presence of dense fibrous connective tissue and pus. The infection can expand through anatomical structures and lead to fistulas and abscesses. Ramos et al.[10] indicate one or more of the symptoms: dyspareunia, dysmenorrhoea, itching, bleeding in coitus, menorrhagia, menstrual flow with blood in IUD users which detected the presence of *Actinomyces spp*. Matsuda et al.[13] reported that the detection rate of *Actinomyces* in cervical and endometrial cytologies in actinomycotic pelvic abscesses was of 77.7%.

A study indicates a 14 times higher risk of the presence of *Actinomyces* in IUD users than in non-users[5]. The prevalence of these microorganisms also seems to be associated with the time of use of the IUD. Lucas et al.[6] shows that in 56.5% of positive cases studied, *Actynomyces* consisted of users of IUD for more than 5 years. On the other hand, Pál et al.[2] studied 51 users of IUD for over 10 years and observed that 29 of them had *Actinomyces spp*. in the genital tract. While Discacciati et al.[9] observed an *Actinomyces* rate of 7% in IUD users and 0% in non users.

While Kim et al.[14] showed that of the 52 patients positive for *Actinomyces*, 42 were users of IUD, of which 65.8% used the device for more than 60 months. This study showed that the pathogen incidence was much lower in Mirena users compared with copper IUD. The copper IUD and the levonorgestrol IUD are equally associated with the development of atypical squamous cells of undetermined significance (ASCUS) after the insertion of the device in patients who have had a normal cervical cytology. However, the copper IUD was associated with a higher rate of depuration of HPV infection when compared with Mirena[15].

According to Silva et al.[8] the users of IUDs showed significantly more benign epithelial changes (p=0.0002) than non-users. In addition, they presented a significantly higher frequency (p=0.0009) of bacterial vaginosis in cytological studies. Findik et al.[11] showed a higher frequency of bacterial vaginosis, *Candida spp*., and *Actinomyces spp*. (p>0.001), when compared to women who used oral contraceptive. Baris et al.[16] showed a statistically significant report (p=0.03) between bacterial vaginosis and the use of birth control, including IUDs (12% of patients with IUD presented vaginosis). However, Discacciati et al.[9] did not identify significant differences in detecting inflammatory and cytopathological changes in cervical smears in the 104 IUD users, as compared to a group of 104 women who used another type of contraceptive method, not establishing a relationship between the use of IUDs and the increased risk for the development of dysplasia. There was no significant difference in the detection of *Candida spp*. or *Trichomonas vaginalis* between the two groups.

CONCLUSION

Although some studies have associated the use of IUD with some genital infections, such as bacterial vaginosis[14,16], the most common association was related with *Actinnomyces spp*.[5,9,11]. Such cases should be evaluated very carefully because of the risk of complications such as PID. In addition, the possible greater depuration of infection with HPV requires more extensive studies.

Conflict of interests

The authors reported no conflict of interests.

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