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STUDYING THE PREVALENCE OF VAGINAL AND CERVICAL INFECTIONS IN MARRIED WOMEN AND ITS RELATIONSHIP TO ANAEMIA

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Abstract
The current study aimed to identify and diagnose bacterial infection that cause vaginal and cervical infection in married women and correlating this to anaemia. Therefore, 186 vaginal swap were collected from them for the period from first of March 2022 to the third of August 2022 and their age was between 20-60 years, in the meantime blood test was done simultaneously. Results show that about 165(89%) samples were positive for microbial. From those about 65 (39.3%) samples were single bacteria, 47 (28.4%) mixed bacterial species, 20 (12.1%) samples were candida and 33 (20.0%) samples were mixed between bacteria and candida. Results also showed that 100 (53.7%) from the total number of patients suffered from anaemia while 86(46.2%) had normal haemoglobin levels. Highest anemic group aged 20-30 years whilest lowest lrvel recorded in elder people 50-60 ages.

Keywords: vaginal infection, cervix , anaemia

Introduction

Vaginal infections are irritations in the vagina due to a microbial invasion that leads to changes in vaginal secretions as well as itching, bad smell and other symptoms (1) Vaginal and cervical infections are considered public health problems in society, especially in developing and developed countries. (2) These infections are defined as infection of the vagina and cervix, as pathogens replace the normal flora of Lactobacilli present and naturally represented in it (3) where Lactobacilli play an important role in protecting the vagina from the invasion of pathogens, as these bacilli work to ferment glycogen produced by epithelial cells vaginalis to lactic acid, which makes the acidic environment not conducive to the growth of other organisms and also the production of Bacteriocins , H_2O_2 and other factors that inhibit the growth of other microorganisms (4) Bacterial infection of the female reproductive system is more common in women of childbearing age and is more susceptible to infections than the male reproductive system due to the shortness of the urethra and the proximity of the anus to it. In addition to that, the presence of vaginal secretions and the menstrual cycle and the presence of normal symbionts in the female reproductive system that may turn into pathogens As a result of the influence of hormones, weak body resistance, and low acidity of the vagina (5), it is also considered the normal flora present in the stool, as it colonizes the opening of the vagina and urethra, and has the ability to stick, grow and multiply in the area and cause disease (6). Also, urinary tract infection (UTI) is considered one of the factors that play an important role in the occurrence of genital injuries in women, as well as cases of pregnancy and miscarriage, and the use of some types of contraceptives (7).

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Recent studies also showed that bacterial vaginosis is highly dominant among sexually transmitted diseases in pregnant women, and that about half of pregnant women showed infections in the cervix and vagina, and it is often prevalent among economically weak groups (8)

Also, the percentage of the causes of infections in the female reproductive system, especially the vagina and cervix, such as bacterial infections, which constitute (50% - 45%) of infection cases, and fungi form (35% - 40%). There are also viral and parasitic infections. Mixed infections caused by different microorganisms also occur simultaneously (9).

Anaemia is a condition in which the ability of the blood to carry oxygen decreases due to the lack of haemoglobin in red blood cells (10) and anaemia can occur due to many reasons, including bleeding, decreased production of red blood cells, increased breakage of red blood cells, and other reasons (11). Anaemia is considered the most common blood disorder, as it affects a third of the world's population, and cases abound in the poor class of society. Anaemia cases are more frequent in women than in men, especially in the stage of fertility and pregnancy (12). One of the most important complications of anaemia is permanent fatigue, weak immune system, and many other complications (13) (14).

Materials and Methods

A total of 186 vaginal swabs were collected using a sterilized swab by specialized female doctors for patients ranging in age from 20-60 years for married women to private clinics for female gynecologists who suffer from clinical symptoms and signs of vaginal infections for married women. For a period of six months, from 1/3/2022 to 3/8/2022. Many and accurate tests were conducted for these swabs using approved scientific methods in the diagnostic laboratories to find out the pathogens. On the other hand, blood was collected from each patient in order to test the percentage of anaemia for them using the CBC test.

Isolation and Diagnosis

Vaginal swabs taken from patients were cultured on different culture media, including Blood agar, Nutrient agar, Potato dextrose agar, sabouraud Dextrose agar, in order to develop microorganisms in them. Various microscopic and biochemical tests were conducted for these developing isolates in order to accurately diagnose scientifically approved (15) (16) For each of these isolates, on the other hand, an anaemia test was performed for each patient using the CBC test.

Results

This study showed that 165 (89 %) out of 186 smears were positive for bacterial culture and 21 (11.2%) swabs were negative for bacterial culture. As shown in Figure [1] and the absence of growth in culture-negative samples, the reason may be due to the patients' use of antibiotics before taking the sample, despite confirmation that they did not take antibiotics before taking the sample, or the reason may be due to the presence of other types of inflammatory factors other than It can be cultured, which needs other techniques to identify it, such as viruses or chlamydia, etc. This result was close to the result of (17).

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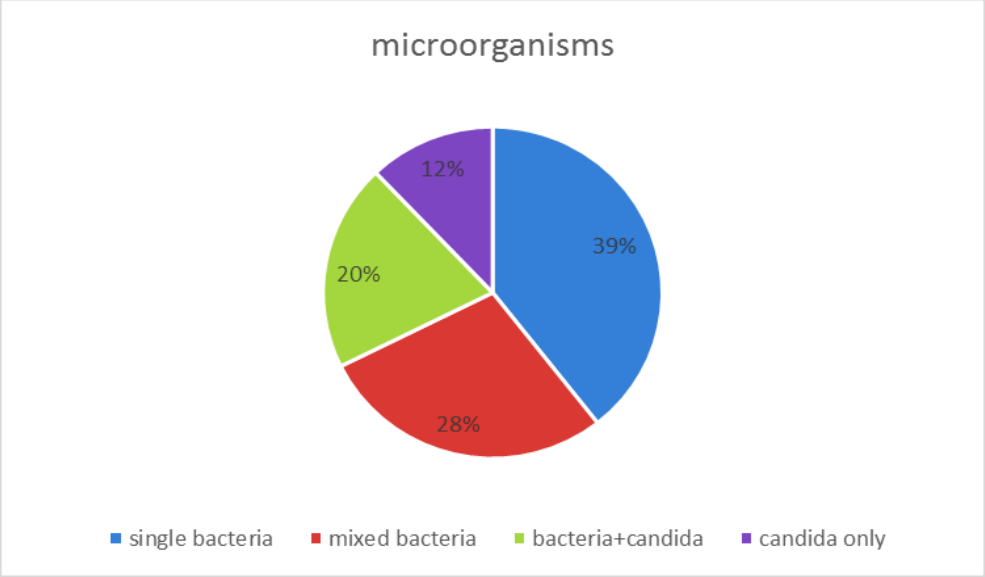

Figure 1: bacterial growth in the culture media.

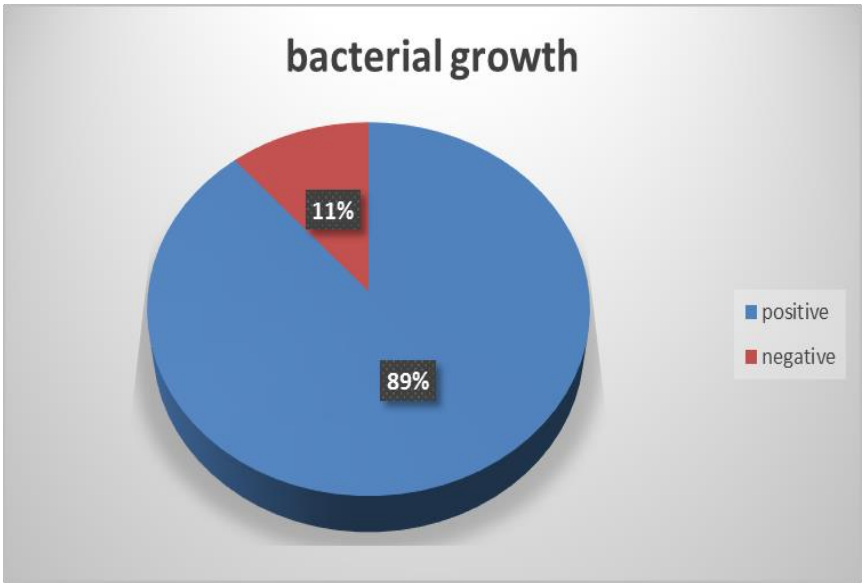

Figure 2: Isolates types in the study.

The infections were vaginal infections in different age groups in this study, where the highest percentage of infections was in the age group of 20 years was 52 (31.5%), then followed by the age group of 30 years was 46 (27.8%), then 40 years was 34 (20.6%), then the age group of 50 years was 19 (11.5%) and the lowest percentage was in the age group of 60 years was 14 (8.4%) out of 165 positive swabs as shown in Table (1).

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Table 1: represents the life stages of women infected with infections of the vagina and cervix

Age	20	%	30	%	40	%	50	%	60	%	total	%
No.	52	31.5	46	27.8	34	20.6	19	11.5	14	8.4	165	100

On the other hand, the results of this study showed that the percentage of bacteria causing infections of the vagina and cervix was from a group of Gram-negative bacteria and a group of Gram-positive bacteria, and the total number of bacteria isolated in this study was 145 isolates out of 165 smears with a positive result. The percentage of *E.coli* bacteria was 39 (26.8%), and this result is close to the result of (18).That the first cause of inflammation of the vagina and urinary system in women. Then it was followed by *Staphylococcus aureus*, with a percentage of 27 (18.6%), then it was followed by *Staphylococcus epidermis*, which was 26 (17.9%). This result indicated that all types of *Staphylococcus aureus* were similar to the study (19). There are other isolates in this study with different percentages, including *Streptococcus*. *Agalactia* was 17 (11.7%), *Enterococcus* 16 (11.1%), followed by *Proteus* and *Gardnerella vaginalis*, the same percentage was 7 (4.8%), then *Klebsiella* was followed by 4 (2.7%), and the lowest percentage was for *Pseudomonas aeruginosa*, with a percentage of 2 (1.3 %) These results are close to the study (20) as shown in Table (2).

Table 2: Number of bacterial isolates isolated from vaginal and cervical swabs

Bacteria	**No.**	**%**
E. coli	39	26.8
Staphylococcus aureus	27	18.6
Staphylococcus epidermidis	26	17.9
Streptococcus agalactiae	17	11.7
Enterococcus	16	11.1
Proteus mirabilis	7	4.8
Gardnerella vaginalis	7	4.8
Klebsiella	4	2.7
Pseudomonas aeruginosa	2	1.3
Total	145	100

On the other hand, the results showed that there were some swabs or samples taken from the vagina and cervix that were of mixed bacteria between Gram-positive and Gram-negative bacteria, where the mixed smears reached 47 (28.4%) of the total positive isolates in this study, the highest percentage being *E. coli* + *Staphylococcus epidermidis*, with a percentage of 14 (29.7%), followed by *E.coli* + *Staphylococcus aureus*, with a percentage of 14 (29.7%). The lowest mixing rate was between two bacteria, *Staphylococcus epidermidis* + *Klebsiella*, with a number of 4 (8.5%) of the total number of bacteria. Mixed isolates. The researcher indicated (21) the presence of mixed isolates when studying swabs for bacterial infection among women, as shown in Table (3).

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Table 3: for a group of mixed bacteria between gram-positive and gram-negative bacteria

Bacteria	No.	%
E.coli + Staphylococcus epidermidis	17	36.2
E.coli + Staphylococcus aureus	14	29.7
Staphylococcus aureus + Proteus mirabilis	6	12.7
E.coli +Enterococcus	6	12.7
Staphylococcus epidermidis + Klebsiella	4	8.5
Total	47	100

This study showed a clear dominance in the presence of fungi, especially *Candida albicans*, which appeared singl in some vaginal smears and reached 20 (12.1%) isolates out of the total number of positive isolates. of the total isolates in this study. The highest mixing ratio was among *E. coli + Candida albicans* 18 (54.5%), followed by *Staphylococcus aureus + Candida albicans*, the number of which was 6 (18.2%) isolates, and the lowest percentage was among *Klebsiella + Candida albicans* bacteria, with a rate of 1 (3.0%) of A total of 33 isolates mixed between bacteria and *Candida albicans*, and these results came close to a study (20), knowing that the presence of fungi is considered a normal flora, but they are considered opportunistic organisms as shown in Table (4).

Table 4: Shows a group of mixed isolates between the bacterium and *Candida albicana*

Name	No.	%
C.albicans + E.coli	18	54.5
C.albicans + Staphylococcus aureus	6	18.2
C.albicans + Proteus mirabilis	5	15.1
C.albicans + Staphylococcus epidermidis	3	9.1
C.albicans +Klebsiella	1	3.0
Total	33	100

On the other hand, anaemia was tested for all the reviews that we referred to the doctors in this study using the CBC method. They ranged between 20-60 years, and the result showed that most of the cases of anaemia were in the stage of 20-30 years, reaching 38 (20.45), then followed by a stage from the age of 30-40 years, and it was 32 (17.2%), and the lowest incidence of pain anaemia was in the 50-60 stage years, and it was 11 (5.9%) of the total number of swabs taken from patients in this study, as shown in Table 5.

Table 5 : Shows the percentage of anaemia among the reviews in this study

Age	20 - 30		30 – 40		40 – 50		50 – 60		Total	
No .	No .	%	No .	%	No .	%	No .	%	No .	%
Normal	24	12.9	26	13.9	16	8.6	20	10.7	86	46.2
anaemia	38	20.4	32	17.2	19	10.2	11	5.9	100	53.7
Total	62	33.3	58	31.1	35	18.8	31	16.6	186	100

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References

1- Donders, G. G., Bellen, G., Grinceviciene, S., Ruban, K., & Vieira-Baptista, P. (2017). Aerobic vaginitis: no longer a stranger. *Research in Microbiology*, *168*(9-10), 845-858.
2- Maa'roof, M. N., & Azeez, I. M. (2018). Isolation and Identification of some Bacterial Species From Cervix Infected Women in Salahuddin Governorate. *Tikret Journal of Pharmaceutical Sciences*, *13*(1).
3- Hanlon, G., & Hodges, N. A. (2012). *Essential microbiology for pharmacy and pharmaceutical science*. John Wiley & Sons.
4- Kovachev, S. (2020). Cervical cancer and vaginal microbiota changes. Archives of Microbiology, 202(2), 323-327.
5- Gupta, S., Kakkar, V., & Bhushan, I. (2019). Crosstalk between vaginal microbiome and female health: a review. *Microbial pathogenesis*, *136*, 103696.
6- Quan, M. (2000). vaginitis: meeting the clinical challenge. Clin. Cornevston .,3(!),36-47.
7- Brunham, R. C., & Paavonen, J. (2020). Reproductive system infections in women: lower genital tract syndromes. *Pathogens and Disease*.
8- Kamara,P., Hylton-Kong, T., Brathwaite, A., Rosario, G.R., Kristensen, S., Patrick, N.,Weiss, H.,Figueroa, P.J., Vermund, S.H. and Jolly.P.E.,(2000) Vaginal infections in pregnant women in Jamaica: prevalence and risk factor. Internatonal journal of STD and AIDS, Vol. 11,pp.516-520.
9- Koumans, Eh,; Sternberg, M.; Bruce, C. (2007). The prevalence of bacterial vaginosis in the U.S.A. associations with symptoms , sexual behaviors, and reproductive health. S.T.D. 34,864-9.
10. Dacie, J.V.; and Lewis. S.M. (1991). Blood-cell morphology in health and disease. In: Practical Haematology, 7th ed., JV Dacie and SM Lewis (eds). Churchill Livingstone, Edinburgh, pp. 87-114.
11. Cappellini, M.D.; Motta, I. (2015). Anemia in Clinical Practice-Definition and Classification: Does Hemoglobin Change With Aging? Semin. Hematol. 2015, 52, 261–269.
12. Peña-Rosas, J. (2011) Haemoglobin Concentrations for the Diagnosis of Anaemia and Assessment of Severity. Vitamin and Mineral Nutrition Information System.
13. Silverberg D, Chernin G, Schwartz D. Should a search for Iron deficiency be part of the regular screening in all patients, whether anemic or not? Journal of Hematology & Thromboembolic Diseases. 2014.
14- Wasada I, Eguchi H, Kurita M, Kudo S, Shishida T, Mishima Y, SAITO Y, USHIOROZAWA N, SETO T, SHIMOZUMA K. (2013). Anemia affects the quality of life of Japanese cancer patients. The Tokai journal of experimental and clinical medicine. 38(1):7–11
15- Macfaddin, J.F. (2000). Biochamical test for identification of medical Bacteria 3th ed. Awolters Kluwer company. Baltimore.
16- Brooks, G. F.; Carroll, K. C.; Butel, J. S. and Morse, S. A. (2007). Jawetz, Melnick & Adelbergs Medical Microbiology. 24 "ed. Mc Grew Hill Lange. Acid Free Paper. P.295
17- Razzak, M. S. A., Al-Charrakh, A. H., & Al-Greitty, B. H. (2011). Relationship between lactobacilli and opportunistic bacterial pathogens associated with vaginitis. *North American Journal of Medical Sciences*, *3*(4), 185.

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18- Braunwald. F.;fauci, A.; Kasper, E.; Hauser, C.; Longo, W.; Jameson, B. (2001). "Harrison`s principles of Internal medicine".15thed., Vol.3, London ., pp.1620-1626 .
19-Deng, L., Schilcher, K., Burcham, L. R., Kwiecinski, J. M., Johnson, P. M., Head, S. R., ... & Doran, K. S. (2019). Identification of key determinants of *Staphylococcus aureus* vaginal colonization. Mbio, 10(6), e02321-19.
20- Hussein, F. H.; Essa, M.A.; (2018). Isolation and identification of some Microorganisms Causing Vaginitis and Cervicitis and Relationship of Risk Factors with these Infections journal of Al Rafedain Vol.27 No.3 P77-94 .
21- Lennox, J.A.; Abbey, S.P.; Udiba, D.; Mboto, C.I.; Ikpoh, I.S.; and Akubuenyi, F.C. (2013). Prevalence of Vaginitis and Vaginosis among university of Calabar female students. *J. public Epidemipol.* 5(4), 167-172
22- Tortora, G.H.; Funke, B.R.; Case, C.S. (2010) "Microbiology an introduction". Benjamin cummings publishing company . Menlopark, California., pp 504-513