ISSN 2706-6819 Vol.3, Issue 3: 55-60, DOI: 10.25236/IJFM.2021.030310

Pathological Study of Gynecological Leucorrhea Smear

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Abstract: *Through the pathological study of 6000 cases of leucorrhea smear in 6 years, the pathogenesis of leucorrhea disease in women in shangluo city was revealed, and the specific etiological classification was summarized, in order to accurately judge the infection type and source of leucorrhea disease in women, and to screen cervical cancer or possibly cervical cancer lesions.*

Keywords: *Leucorrhea, BTR, Infection, Vaginitis.*

1. Introduction

Leucorrhea is a mixture of mucus and exudates secreted by female reproductive organs, and the fluid discharged from the body. Under normal circumstances, the amount of leucorrhea is small, sticky, and has no peculiar smell, which can keep the perineum in a moist state, thereby ensuring women's vaginal health [1-2]. Abnormal leucorrhea often points to gynecological diseases. Under normal circumstances, the female vagina has a self-purifying effect, which can form a natural defense barrier to resist the invasion of various pathogenic microorganisms from the outside world. When this natural defense function is disrupted and the balance between vaginal microorganisms is broken, it is easy for patients to develop gynecological diseases such as trichomonas vaginitis, fungal vaginitis, fungal vaginitis, non-specific vaginitis [3]. Vaginal disease is one of the common gynecological diseases, with a high incidence, which is caused by the decline of the immune function of the female body, the disorder of the vaginal micro-ecological environment, and the invasion of pathogenic bacteria. These diseases seriously affect women's physical and mental health and quality of life, resulting in changes in the characteristics of vaginal discharge. Gynecological leucorrhea is the most common clinical manifestation of gynecological diseases such as vaginitis, cervicitis and cervical cancer. It is usually diagnosed by leucorrhea smear. Early differential diagnosis of the types of infections in the reproductive system of patients is the main prerequisite for effective treatment of patients[4-5].Traditional leucorrhea smear staining method, the use of HE (wood grain - eosin staining or thin liquid layer (pap) dyeing, the dyeing method used for long time, dyeing display content limitation, the inside of the main display leucorrhea smear nuclear heterogeneous cells and suspected cancer cells and cancer cells, cannot display biological source of infection, such as vaginal trichomoniasis, bacteria, mold, etc. Many patients can not be timely and effective treatment, seriously affect the physical and mental health of patients, reduce the quality of life.

Gynecological diseases have a high incidence and a wide range of epidemics, which seriously affect the reproductive health of married women of childbearing age. Therefore, it is necessary to carry out the general survey of gynecological diseases. Only with a clear diagnosis can there be reasonable treatment.Leucorrhea smear examination is mainly to check cleanliness, parasites and pathogenic bacteria. In the traditional leucorrhea examination method, different pathogenic microorganisms correspond to different detection methods, which are complicated to operate, take a long time, and high detection cost. Usually, 7 items of leucorrhea are checked, and 4 samples and 4 smears are required to be sent to the two departments of pathology and inspection for reading [6]. In response to this situation, we selected the "Gynecological Leucorrhea Multifunctional Dyeing BTR Technology" through investigation. The multifunctional staining technique for vaginal discharge smears (BTR method) is a practical new technique for morphological inspection. This method can use staining solutions with multiple functions for staining inspections according to the different morphological characteristics of leucorrhea pathogens. BTR multifunctional staining solution is composed of R1 solution and R2 solution. It can stain leucorrhea smears. It can be used for trichomonas, mold, ciliates, gonorrhoeae, gardnerella, nuclear heterogeneous cells and cancer at the same time on one smear. Multiple examinations such as cells have simple methods, clear staining morphology, and high detection rate,

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which can provide a reliable basis for clinical diagnosis and treatment [7]. We collected 6,000 cases of vaginitis, cervicitis and suspected cervical cancer from 2006 to 2012 in Shangluo District and surrounding rural areas. BTR technique was used for staining diagnosis.

2. Materials and methods

Hunan Zhuzhou Kangle Testing Reagent Co., Ltd. produced gynecological leucorrhea smear multi-functional dye.The test was carried out in strict accordance with the instructions of the kit. If there are suspicious bacteria, dry oil mirror inspection.

3. Classification

According to the main causes of 6000 patients with leucorrhea, they were divided into vaginitis and cervical diseases, as shown in Table 1.

Table 1 Pathological classification of 6000 patients with leucorrhea.

Project	The number of cases	The percentage(%)
vaginitis	5370	89.5
cervicitis	630	10.5

Note: cervicitis group and vaginitis group were compared, P<0.01.

3.1 Vaginitis is classified by etiology

There were 5370 cases of vaginitis, and there were 5 main sources of infection according to the classification of etiology, including single infection and compound infection. 4350 cases of single infection and 1020 cases of compound infection. See the table below.

Table 2 5370 single infection rates of vaginitis.

The sources of infection	The number of cases	The percentage(%)
B. gatneri	1680	31.29△
The cilia bacteria	1470	27.37▲
mold	486	9.05
trichomonad	354	6.59
Other bacterials	360	6.7
Total	4350	81.00

Note: Candida, Trichomonas and miscellaneous bacteria groups were compared with C. gatneri △ and C. ciliae ▲ groups (P <0.05).

Table 3 5370 combined infection rates of vaginitis.

The sources of infection	The number of cases	The percentage(%)
B. Gatneri and mold	300	5.59☆
B. gatneri and trichomonad	282	5.25★
B. gatneri and The cilia bacteria	186	3.46◇
The cilia bacteria and mold	174	3.24◆
The cilia bacteria and trichomonad	60	1.12○
mold and trichomonad	18	0.34□
Total	1020	19.00

Note: ☆ ★ , ◇ , ○□ were all compared with each other with P <0.05.

Table 4 Single and compound infection rates of B. gattenella in 5370 cases of vaginitis.

The sources of infection	The number of cases	The percentage(%)
B. gatneri	1680	31.29
B. gatneri and mold	300	5.59
B. gatneri and trichomonad	282	5.25
B. gatneri and The cilia bacteria	186	3.46
Total	2448	45.59

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Table 5 Single and compound infection rates of ciliomycetes in 5370 cases of vaginitis.

The sources of infection	The number of cases	The percentage(%)
The cilia bacteria	1470	27.37
B. gatneri and The cilia bacteria	186	3.46
The cilia bacteria and mold	174	3.24
The cilia bacteria and trichomonad	60	1.12
Total	1890	35.19

Table 6 Single and compound infection rates of 5370 vaginitis mold.

The sources of infection	The number of cases	The percentage(%)
mold	486	9.05
B. gatneri and mold	300	5.59
The cilia bacteria and mold	174	3.24
mold and trichomonad	18	0.34
Total	978	18.22

Table 7 Single and compound infection rates of Trichomonas vaginitis in 5370 cases.

The sources of infection	The number of cases	The percentage(%)
trichomonad	354	6.59
B. gatneri and trichomonad	282	5.25
The cilia bacteria and trichomonad	60	1.12
mold and trichomonad	18	0.34
Total	714	13.30

3.2 Cervicitis and Nuclear heterogeneous cell

Among the 6000 patients with leucorrhea, 630 cases were diagnosed as cervicitis, including 36 cases with mild nuclear heteroplasm, 18 cases with moderate nuclear heteroplasm, and 6 cases with severe nuclear heteroplasm.

4. Discussion

4.1 Ideal dyeing material

BTR dyeing technique is an excellent dyeing method, which is convenient, economical and clear. The preparation process takes only 8 minutes. Staining results are ideal, not only can show various lesions of vaginal and cervical epithelial cells, but also can clearly show vaginal trichomonas and ciliomycetes, Gallneria, miscellaneous bacteria, neisseria gonorrhoeae, mold and other 6 biological infection source components.

4.2 Analysis of the incidence of vaginitis and cervicitis

The department received 6000 cases of leucorrhea at the end of 6 years, including 3218 cases of vaginitis, accounting for 89.5%. There were 630 cases of cervicitis (10.5%). Vaginitis is the main type of leucorrhea.

4.3 Analysis of the prevalence and characteristics of vaginitis

4.3.1 Characteristics of B. gatneri infection

Bacterial vaginosis contains a large number of Gardnerella and anaerobic bacteria in vaginal secretions. These bacteria can cover the squamous epithelial cells to form clue cells, which are important indicators for the diagnosis of bacterial vaginosis[8]. The number of patients with abnormal increase in leucorrhea, which showed that the source of infection was the clue cell (B. cantonensis), was 1680, and the number of cases increased to 2448, with an infection rate of 45.59%. There were 1470 cases of ciliated bacteria in seven cases, and the number of cases reached 35.19% when combined infection cases were included. The vagina is in a hypoxic environment, which is in line with the growth conditions of anaerobic bacteria. When the body resistance is reduced, anaerobic bacteria infection is

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easy to occur. The infection rates were 45.59% and 35.19%, respectively.

4.3.2 Infection characteristics of mold, trichomonas vaginalis and miscellaneous bacteria

The second are mold, vaginal trichomonas and miscellaneous bacteria.

Mold infection took the first place in the second platform. There were 486 cases of single infection, and 978 cases of combined infection, accounting for 18.22% of 5370 cases. Patients with fungal infection usually have beriberi infection lesions, and beriberi infection is the main source of infection of vaginal fungal infection, and the main transmission channels are sexual intercourse, bath, bath towel, etc. Especially bad habits, such as husband and wife cross infection, underwear and socks placed together washing is also a common way of infection. All these suggest that the preventive measures to control mycotic vaginitis are primarily to improve life and health habits. In addition, the infection rate of mycotic vaginitis increased significantly in patients with increased leucorrhea in early pregnancy, suggesting that in early pregnancy, estrogen level decreased, progesterone level increased may be related to mycotic infection.

Trichomoniasis was diagnosed in 354 of the 5370 cases we studied, with 714 cases including compound infections, accounting for 13.3% of vaginitis, ranking fourth.

The diagnosis of miscellaneous bacterial infection is when there is a clear indication of bacteria in the smear, but the species cannot be determined. We commonly refer to them as miscellaneous bacteria, and they may be many other different types of bacteria, which need to be further subdivided to determine their attribution.

4.3.3 Statistical results analysis

The results showed that the combined infection of two infectious agents accounted for 19% of our 5370 patients with vaginitis, meaning that nearly a quarter of the patients were co-infected. Among them, 300 cases, accounting for 5.59%, were infected with B. gatneri. There were 282 cases (5.25%) of c. gatneri + Trichomonas; Both compound infection rate is similar, they are in complex cases is nearly tied for first, in the second place is gartner coli ball + cilia bacteria and cilia bacteria, mould compound infection, their infection rate is similar, 186 cases, respectively, 3.46% and 174 3.24%, the third is the cilia fungus + trichomonad 60 cases, accounting for 1.12%, The fourth was mold + trichomonas 18 cases, accounting for 0.34%, which accounted for a small proportion.

We believe that the following four factors are related to compound infection. A. The biological characteristics and living habits of co-infection sources are similar, and the antagonistic effect of mutual inhibition is weakened; B. Changes in the vaginal environment, such as PH, are conducive to their co-growth; C. Changes in gonadotropin produced by the pituitary gland and estrogen progesterone produced by the ovary; D. The protective damage of vaginal mucosa and many other factors are conducive to the co-reproduction of pathogens.

4.4 Analysis of prevalence of cervicitis and other related factors

Of the 6000 patients we treated, 630 were pathologically diagnosed with cervicitis, accounting for 10.5% of the total. Our diagnostic criteria for cervicitis were the detection of basal cells, squamous cells, neutrophils and erythrocytes. If there is an obvious source of infection, the clinician will treat vaginitis with cervicitis. If abnormal cells are found, we suggest further cervical biopsy to confirm the lesion degree of cervicitis and whether there is cervical CIN(cervical intraepithelial neoplasia), so as to provide a reliable basis for clinical treatment.

4.5 BTR staining for diagnosis of leucorrhea

4.5.1 Sampling of leucorrhea during medication

During the clinicopathological diagnosis, a small number of cases had obvious symptoms of increased leucorrhea, but irregular granular or crystalline materials were observed under microscope, and there was no source of infection. This is often because drugs have been placed in the vagina before the patient returns to our hospital, masking the cause of the disease that should have been revealed. For such patients, we generally require her to stop taking drugs for a week after the review, can be clear about the type of infection.

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4.5.2 Diagnostic methods of patients with bleeding

In some patients with cervical erosion and vaginitis, the infection was diluted or covered by blood due to more bleeding when taking samples. For this patient, we require a review three days later, do not touch the cervix of the review sample, as far as possible in the vaginal posterior fornix sample smear.

4.5.3 Degree of white blood cell infiltration in vaginitis or cervicitis

The main factors causing bacterial vaginosis are the decrease of Lactobacillus in the vagina and the continuous increase of anaerobic flora.In this period will be accompanied by the nature of the vaginal secretions and produce a syndrome, in which most of its pathological characteristics are leukocyte infiltration and no inflammatory lesions, in the early examination of bacterial vagpososis positive patients can be found that its leucorrhea routine mirror examination, generally there will be a large number of epithelial cells and pus ball and other inflammatory cells[8].

In the leucorrhea smear of vaginitis or cervicitis, there is usually an exudation of neutrophils of medium size, which is a defensive anti-damage response to inflammation.The mechanism of the appearance of leucorrhea is essentially the exudative reaction of inflammation, and the exudate includes fluid exudation and cell exudation. The exuded white blood cells should generally be neutrophils, which is a characteristic of acute inflammation. If there are few or no neutrophils in the leucorrhea, it means that the patient's body has significantly reduced resistance. This should prompt doctors to pay attention to enhance the resistance of patients in the treatment.

4.5.4 Diagnostic precautions for senile vaginitis (naked nucleus cell)

In a small number of patients over 60 years old, there is no clear infectious agent at the time of examination, and a small amount of leukocyte infiltration and a large number of bare nuclear cells and underlying cells are the characteristics of this disease. This is because ovarian atrophy leads to sudden reduction of hormone level, vaginal epithelium loses hormonal support and the physiological atrophy caused by, can belong to senile disease category change. Because the individual to this atrophic change needs an adaptation process to show the discomfort reaction, called senile vaginitis.

5. Conclusion

Leucorrhea smear multi-functional staining technology (BTR method), not affected by external environmental factors, a smear can be a number of examinations, simple and quick operation, accurate examination results, high detection rate. In short time can detect the female cervix of different degrees of gynecological diseases and ovarian function of the recession. BTR is formulated with distilled water, which overcomes the volatile shortcomings of ethanol and other organic solvents, and cleverly incorporates fixatives and sterilants into it, reducing operating steps and minimizing the occupational risk of iatrogenic infections of inspectors. The clinical application of this technology not only alleviates the annoyance caused by women taking more specimens, but also reduces the workload of clinical and inspection personnel [7].

By departments of 6000 cases of leucorrhea disease diagnosis, classification, analysis, induction, we found that in shangluo city and its surrounding areas, leucorrhea disease of department of gynaecology to vaginitis, its pathogenic agents lined for gartner ball coli (clue cells), cilia bacteria, mold and vaginal trichomoniasis, we put the four pathogenic agents cause vaginitis respectively: Vaginitis of bacterial sex disease, cilium fungus sex, mould sex vaginitis and trichomonas sex vaginitis. These four kinds of vaginitis are the main diseases that we prevent and treat. If the pathogen diagnosis is made clear, the clinical treatment can achieve satisfactory results.

The diagnosis of cervicitis by BTR staining, which accounts for 10.5% of the total cases, can also be helpful in determining whether patients with cervicitis are accompanied by bacterial and trichomonas infections, especially for the detection of dysplastic cell disease

May provide further biopsy or other methods of in-depth examination.

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ISSN 2706-6819 Vol.3, Issue 3: 55-60, DOI: 10.25236/IJFM.2021.030310

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