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EFFICIENCY OF PDT IN SEVERE CERVICAL DYSPLASIA

Akhmatova Gulrukh Rakhmatovna*

*Bukhara State Medical Institute,
UZBEKISTAN

ABSTRACT

One of the most promising and high-tech methods of treating severe dysplasia and cervical cancer today is photodynamic therapy (PDT), based on the principle of selective destruction of pathologically altered cells. This is achieved due to the effect of photo-radiation on cells, in which a special chemical substance accumulates. The essence of the method lies in the application or introduction of a certain chemical compound into the affected area and further exposure, for example, with a laser. Selectivity or selectivity is a necessary property of all drugs and substances, methods of exposure used to treat cancer and precancer. Selectivity assumes that the introduced substance or effect aimed at destroying cancer cells will not act on healthy tissues, otherwise all destructive methods of treatment will be harmful or fatal to the whole organism. Cervical cancer has the same signs of living tissue, therefore, the main difficulty in creating a selective effect is to study the properties and differences of malignant structures from normal ones. Initially, PDT in gynecology was used to treat early forms of malignant neoplasms, or was used in the complex treatment of severe widespread processes. At present, the technique, due to the achievement of high selectivity, can be prescribed for the treatment of background and precancerous diseases of the cervix, including severe dysplasias. To date, the experience of treating women with cervical pathology using the method of photodynamic therapy shows its high therapeutic activity, a minimum number of complications and side effects.

KEYWORDS: *PDT, Dysplasia, Cancer, Cervix, Precancer.*

INTRODUCTION

Photodynamic therapy (PDT) and diagnostics (PDD) have become recognized therapy and diagnostic tools for cancer treatment. This method requires at least three agents to coexist. A photosensitizer (PS), at the correct energy density and wavelength, converts chemical

compounds (such as molecular oxygen O2) into free radicals that directly cause local toxicity. Nevertheless, the effectiveness of the treatment procedure is a complex dependence of the energy density of the activating light, the initial concentration of the photosensitizer, and the PS filling factor. Porphyrin derivatives and some other sensitizers require an appropriate oxygen concentration. In addition, these amounts and conditions may change during treatment due to photobleaching of the sensitizer, oxygen consumption, changes in PS concentration, and other factors. Effectiveness can also vary by patient and drug. In gynecological PDT, the menstrual cycle influences fluorescence spectroscopy as a monitoring tool for dosimetry and diagnostics1 There are several aspects to consider when calculating the dose of excitation light. Higher illumination can cause thermal effects in the tissue, as well as rapid oxygen consumption, leading to photobleaching and phototransformation of the photosensitizer.2,3 This can reduce the effective concentration of the sensitizer, so a higher treatment efficacy is needed. either by increasing the treatment time (decreasing illumination) or by excitation with a fractionated light source.4,5 Photochemical modification PS and oxygen consumption should also be taken into account during prolonged exposure to light.

There is also a need for the development of sensitizers that absorb longer wavelengths due to deeper penetration of light into tissues that are not affected by hemoglobin uptake.

Moreover, the radiation dose absorbed by photosensitizers is highly dependent on the illumination configuration and the uniformity of light emitted directly from the source6 or from the light applicator 7,8, as well as on the structure and morphology of the surface. As we show, the complex shape of the organ can also seriously affect the efficiency of light penetration into the tissue, affecting all successive stages of the treatment procedure due to the inhomogeneous delivery of the light dose. There have been few attempts to consider the effect of organ shape on PDT performance.9,10

The aim of this work is to develop an approach to PDT in patients with early stages of malignant neoplasms and severe dysplasia.

The following research tasks :

1.Influence of the shape of the cervix on the effectiveness of photodynamic therapy

2. To determine the advantages of PDT over other methods.

3. Determine which drugs are most effective in PDT patients.

Methods

1. The effectiveness of PDT in different positions in manipulating patients with severe dysplasia and cervical cancer will be studied.

2. The effectiveness of all methods of treatment will be studied and the advantages of PDT will be determined.

3. Individually acting drugs that will be used in PDT treatment will be studied.

RESEARCH RESULTS AND DISCUSSION

We will be able to find a more effective treatment for PDT by changing the position of the cervix.

Studying the effectiveness of all methods in the treatment of severe dysplasia or early stage cervical cancer, selectively change the tactics of PDT treatment.

We will be able to find out what drugs will help with this method of PDT treatment in combination therapy.

Conclusion. PDT of patients will allow to solve problems with many complications that arise with other methods in the treatment of severe dysplasia of the cervix and cervical cancer. Higher rates of eradication of oncogenic HPV types in comparison with therapeutic, surgical and physical methods of influencing HPV and the absence of reinfection over a long period of observation, most likely indicate sanitation of the basal layer of the scaly integument, where the virus replicates, and also indicate cell destruction with an integrated form of HPV, when antiviral drugs become ineffective. PDT improves the prognostic factors of the clinical picture of precancerous diseases and early cervical cancer. The obtained results of antiviral efficacy demonstrate the effect of PDT, the purpose of which is to prevent the recurrence of the disease. Preservation of menstrual and reproductive functions gives a woman the opportunity for full reproductive function. Summing up, we can say that PDT is an alternative regimen of organ-preserving treatment, which affects not only the pathological epithelium, but also the etiological factors of cervical cancer carcinogenesis, which allows not only to cure the patient, but also leads to the complete medical and social realization of the woman.

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