COLPOSCOPY IN MODERN GYNECOLOGY AND OBSTETRICS

KOLPOSKOPIA W NOWOCZESNEJ GINEKOLOGII I POŁOŻNICTWIE

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SUMMARY

A screening for a uterine cervix carcinoma is entering a new era. Instead of searching for abnormal pathological changes in the cells of uterine cervix, more and more frequently we are looking for factors evoking these changes, i. e. oncogenic types of HPV. In this way we are swiftly running away from a screening based on a cytology and colposcopy towards the one which depends on hybridization tests. One should, however, remember that screening conducted in this manner allows indeed for a precise distinguishing of a group of women with a risk of becoming ill from cervical carcinoma, but both the colposcopy and cytology are essential for establishing a proper strategy in a clinical management. It is difficult to imagine that only a fact of the infection of the uterine cervix epithelium with papilloma viruses, without morphological abnormałities detected in the epithelium, would be an indication for cervix treatment. At present, we are witnessing an intense development of modern techniques in the colposcopy. Proposals to improve the colposcopy are aiming at rendering objective an inspection of colposcopy images and enhancing a precision of diagnosis. However, the mentioned techniques are not available for each gynecologist. He does not always have to have an access to them because, as it appears from available literature, these modern procedures influence only in a small degree the increase in sensitivity and specificity of the rewieved method, and so far have mainly a scientific significance. In this situation, an essential practical importance has still a routine diagnosis using a colposcope with the application of routine colposcopy methods. Undeniable progress in the colposcopy represents a conviction that this method allows for a diagnosis of subclinical HPV infection of the uterine cervix. The colposcopic diagnosis of the subclinical HPV infection of the uterine cervix, supplemented with cytological examinations, is highly precise and finds a confirmation with hybridization methods for HPV DNA. A progress in the approach to the colposcopy mainly comes down to recognize this diagnostic method as the essential one in the process of deciding about a nature of morphological changes in the uterine cervix. This approach falls into a concept of targeted rescreening. While using the colposcopy one should, however, remember about limitations of the method. Unquestionable benefit of the colposcopy diagnostics is that the result of investigation is available immediately. If we simultaneously employ a cytological assessment of the uterine cervix in the phasecontrast microscope, we could save the patient a negative psychical stress associated with a relatively long-lasting expectation for the results of cytological examinations.

Key words: Colposcopy, HPV, Infection of the uterine cervix.

STRESZCZENIE

Skrining raka szyjki macicy wkracza w nową erę. Coraz częściej, zamiast szukać nieprawidłowych zmian morfologicznych w komórkach szyjki macicy, szuka się czynników, które wywołują te zmiany, tzn. typów onkogennych HPV. W ten sposób ucieka się szybko od skriningu opartego na cytologii i kolposkopii do skriningu, podstawą którego są testy hybrydyzacyjne. Pamiętać jednak należy, że tak prowadzony skrining (abstrahując od kosztów) pozwala wprawdzie na precyzyjne wyodrębnienie kobiet ryzyka zachorowania na raka szyjki macicy, ale do ustalenia prawidłowej strategii w postępowaniu klinicznym niezbędna jest zarówno kolposkopia, jak i cytologia. Trudno bowiem wyobrazić sobie, aby sam fakt zainfekowania nabłonka szyjki macicy wirusami papilloma, bez stwierdzonych w nabłonku nieprawidłowości morfologicznych, był wskazaniem do leczenia szyjki. Aktualnie notuje się intensywny rozwój nowoczesnych technik kolposkopowania. Propozycje zmierzające do udoskonalania kolposkopii mają na celu zobiektywizowanie oglądanych obrazów kolposkopowych i zwiększenie precyzji rozpoznania. Nie każdy lekarz ginekolog ma jednak dostęp do wspomnianych technik. Nie zawsze zresztą musi, ponieważ te nowoczesne działania tylko w niewielkim stopniu wpływają na zwiększenie czułości i swoistości omawianej metody i jak na razie mają znaczenie przede wszystkim naukowe. W tej sytuacji zasadnicze znaczenie praktyczne ma diagnostyka rutynowym kolposkopem z zastosowaniem rutynowych metod kolposkopowych. Niewątpliwym postępem w kolposkopii jest przekonanie się, że metoda ta pozwala na rozpoznawanie subklinicznej postaci zakażenia HPV. Niewątpliwą korzyścią diagnostyki kolposkopowej jest to, że wynik badania otrzymujemy natychmiast. Jeśli jednocześnie posługujemy się oceną cytologiczną szyjki macicy w mikroskopie fazowo-kontrastowym, to zaoszczędzamy pacjentce negatywnych stresów psychicznych związanych ze stosunkowo długim oczekiwaniem na wyniki badań cytologicznych.

Słowa kluczowe: kolposkopia, infekcje szyjki macicy.

A screening for a uterine cervix carcinoma is entering a new era [1]. Instead of searching for abnormal pathological changes in the cells of uterine cervix, more and more frequently we are looking for factors evoking these changes, i.e. oncogenic types of HPV [2]. In this way we are swiftly running away from a screening based on a cytology and colposcopy towards the one which depends on hybridization tests [3]. One should, however, remember that screening conducted in this manner (leaving aside the costs) allows indeed for a precise distinguishing of a group of women with a risk of becoming ill from cervical carcinoma, but both the colposcopy and cytology are essential for establishing a proper strategy in a clinical management [4]. It is difficult to imagine that only a fact of the infection of the uterine cervix epithelium with papilloma viruses, without morphological abnormalities detected in the epithelium, would be an indication for cervix treatment [5–7].

At present, we are witnessing an intense development of modern techniques in the colposcopy, such as: telecolposcopy, computerized colposcopy, multispectral imaging system colposcopy, computerized digital imaging colposcopy, fluorocolposcopy and photodynamic diagnosis in colposcopy [8–12]. Proposals to improve the colposcopy are aiming at rendering objective an inspection of colpocopy images and enhancing a precision of diagnosis [13]. However, the mentioned techniques are not available for each gynecologist. He does not always have to have an access to them because, as it appears from available literature, these modern procedures influence only in a small degree the increase in sensitivity and specificity of the rewieved method, and so far have mainly a scientiflc significance. In this situation, an essential practical importance has still a routine diagnosis using a colposcope with the application of routine colposcopy methods [14, 15].

It should be emphasized that the colposcopy has a tremendous importance in the clinic of uterine cervix and vagina infections. It permits, on the basis of evaluation of the appearance of the contents covering a vaginal part of uterine cervix and vagina walls, to orient further diagnostics procedures concerning the infections, including sexually-transmitted infections [16].

A distinctive feature of colposcopy images in the uterine cervix inflammation and infections is the presence on a surface of the cerxix a number of intensively red points or spots of variable size (Fig.1). They represent supraepithelial extravasations (petechiae) or clusters of pleomorphic blood vessels. They show through a softened and rugous epithelium. These vessels become clearly apparent after removing a thick content from the cervix surface. The uterine cervix vessels, visible in the cervix inflammation, produce a dense

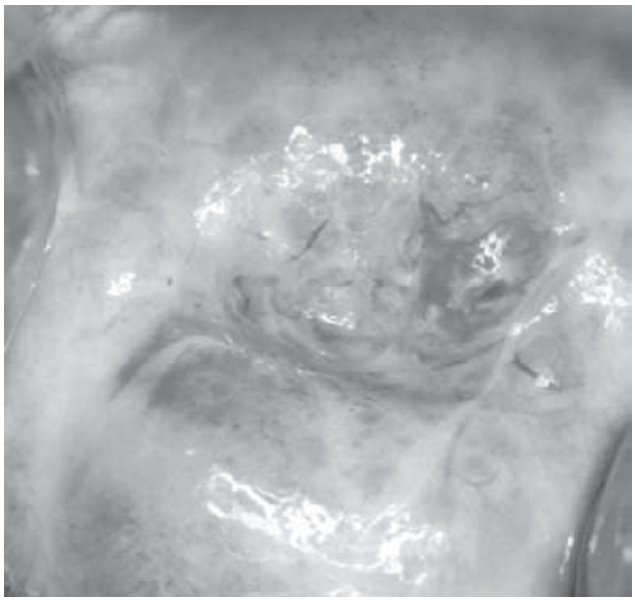

Fig. 1. Inflammation of the uterine cervix. On a surface of the cervix are visible red points and spots of variable size

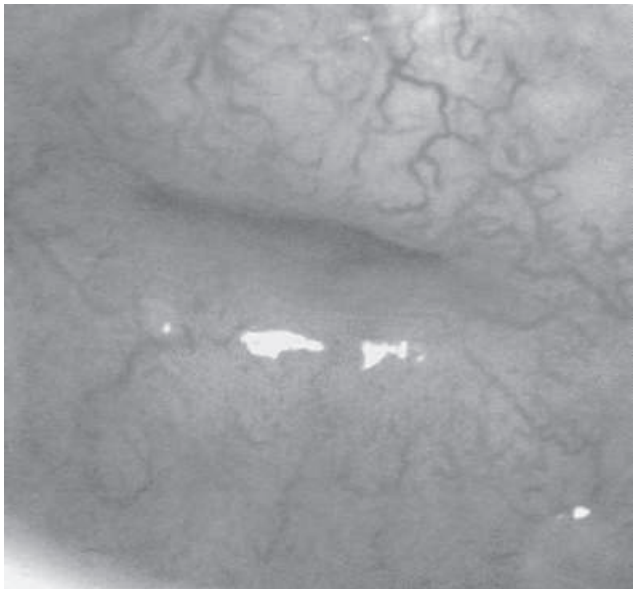

Fig. 2. The cervix inflammation. The uterine cervix vessels produce a dense disordered and disorganized net

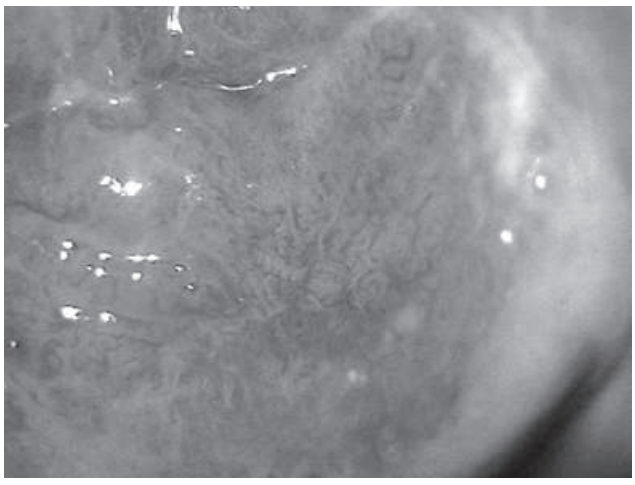

Fig. 3. Infection of the cervix with Chlamydia trachomatis

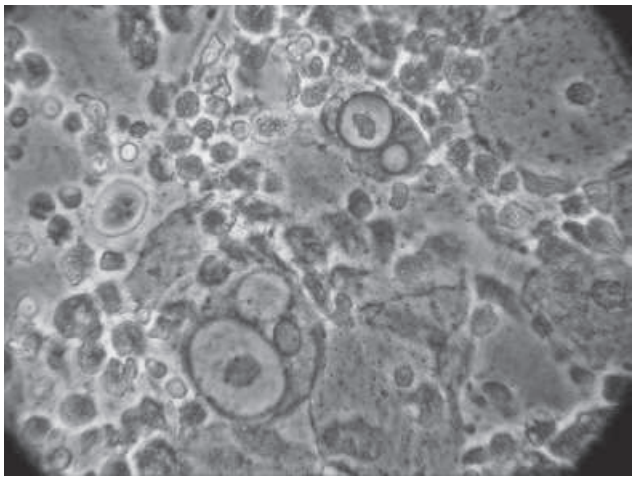

Fig. 4. Infection of the cervix with Ch. trachomatis. In a phase contrast microscope are visible in cylindrical cells vacuoles filled with inclusion bodies

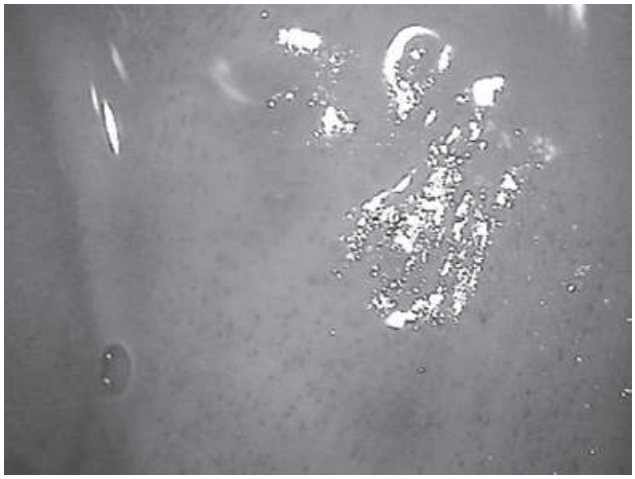

Fig. 5. Trichomonal infestation of the uterine cervix. „A strawberry sign"

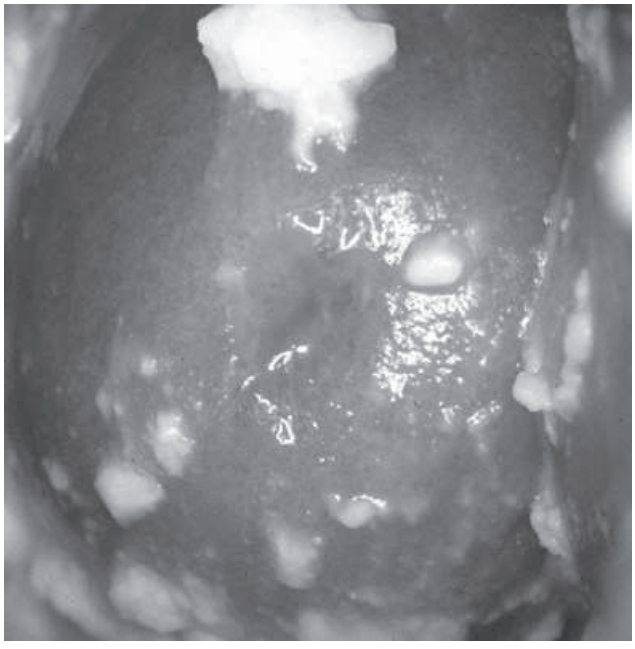

Fig. 6. Mycosis of the uterine cervix

disordered and disorganized net (Fig.2). A diversity in shape and a variable course of vessels in inflamed connective-tissue stroma depends on a differentiated structure of the border between the epithelium and stroma, on connective-tissue papillae and on a degree of hemostasis in the examined vessels.

If enhanced vessel markings described above are accompanied by a zone of epithelial transformation with a more or less extensive ectopy, we may suspect a uterine cervix infection with *Chlamydia trachomatis* [17] (Fig. 3). In cytological smears collected from such lesions there are clusters of cylindrical cells that possess in their cytoplasm numerous vacuoles filled with characteristic inclusion bodies. Such cells are especially well visible in a phase contrast microscope (Fig. 4).

An abundant foamy yellow-and-green vaginai content is a symptom of trichomonal infestation of vagina and uterine cervix. Under colposcopy magnification, the epithelium surface covering a disc of the vaginal part is strewn with the intensively red spots of various size. This symptom resembles "a moth-eaten fabric", or is called "a strawberry sign" (Fig. 5).

A thick papular white content closely adhering to vaginal walls indicates the existence of mycosis (Fig. 6).

A translucent mucoid content at the opening of external cervical canal accompanied by a homogenous grey-and-white content covering the walls of vagina is distinctive for a bacterial vaginosis. A conspicuous microspotty iodonegative "spotting" of paraepidermoidal epithelium, visible under colposcopy following a test with Lugol liquid, confirms a suspicion of the infection with a microorganism *Gardnerella vaginalis* (Fig. 7). This diagnosis can be confirmed by a cytological examination in which aside of a small number of neutrophilic polymorphonuclear granulocytes and a scanty number or a lack of lactic acid bacilli, the marker cells forbacterial vaginosis, so-called clue cells, can be found. The clue cells are well visible in unstained smears when viewed in the phase-contrast microscopy (Fig. 8). They represent large multilateral cells, from both the surface and intermediate strata of the stratified squamous epithelium of the uterine cervix and vagina, densely covered with *Gardnerella vaginalis* bacilli. Light-refracting bacteria appear clearly on the background of the cells and the preparation.

Colposcopy precisely defines the extent of existing changes in the cervix and allows to orient in its morphological character. It detects precancerous and early cancerous states.

The colposcopy plays a decisive role in the process of qualification for the treatment of both precancerous and cancerous states, as well as other pathological states of the uterine cervix [18, 19]. The colposcopy also has an undisputable role in monitoring pregnancy

complicated with neoplasia of the uterine cervix or cancer [20].

One should not ignore the colposcopy as a method for assessing a functional state of female sexual organs. It is particularly important during early pregnancy and in a diagnosis of infertility.

Undeniable progress in the colposcopy represents a conviction that this method allows for a diagnosis of subclinical HPV infection of the uterine cervix. The colposcopic diagnosis of the subclinical HPV infection of the uterine cervix, supplemented with cytological examinations, is highly precise and rlnds a confirmation with hybridization methods for HPV DNA [21]. The subclinical HPV infections could be seen following a test with an acetic acid solution [17]. After the acid, bleached foci appear in the stratified squamous epithelium that did not show any alterations before application of the acid (Fig. 9). A bleaching of the epithelium is small and is maintained for a short period of time. A previous translucency of the epithelium is returning quickly. The epithelium susceptible for bleaching is lustrous and contains an uneven ("coarse") and slightly papillary surface (Fig. 10). If the colposcopy images are accompanied with the cytological images in which koilocytes and dyskeratocytes have been revealed, then the diagnosis of subclinical HPV infection is reliable [20].

In cytological preparations stained with hematoxylin and eosine or with a Papanicolau reagent, a distinctive for koilocytes vacuolization has a nature of empty spaces sharply separated from the rest of cytoplasm in which irregular andhyperchromatic cell nuclei are located. Cytoplasm is condensed at the periphery, and it intensively stains in eosinophilic or cyanophilic manner, and rarely is amphophilic. Koilocytes are also well visible in the unstained cytological smears inspected through the phase-contrast microscope (Fig. 11).

A progress in the approach to the colposcopy mainly comes down to recognize this diagnostic method as the essential one in the process of deciding about a nature of morphological changes in the uterine cervix. This approach falls into a concept of targeted rescreening [17]. The point is that a gynecologist despite a negative result (in the oncological sense) of the cytological smear qualifies the cervix, on the basis of obtained colposcopy images, for another cytological evaluation.

While using the colposcopy one should, however, remember about limitations of the method. By colposcopy investigations we assess only a surface of the existing changes in the cervix. On the basis of the appearance of the surface we are drawing conclusions about their structure and morphological nature. Sometimes these conclusions could be incorrect.

Unquestionable benefit of the colposcopy diagnostics is that the result of investigation is available im-

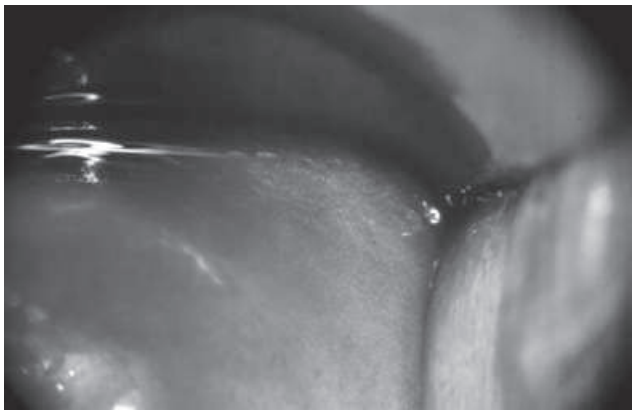

Fig. 7. Bacterial vaginosis. Iodonegative „spotting" of paraepidermoidal epithelium visible under colposcopy following a test with Lougol Iiąuid

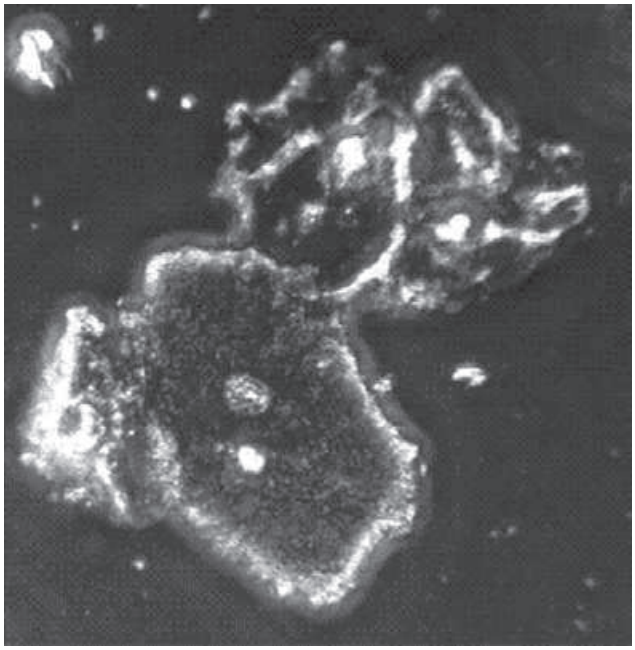

Fig 8. Clue cells in a phase-contrast microscopy

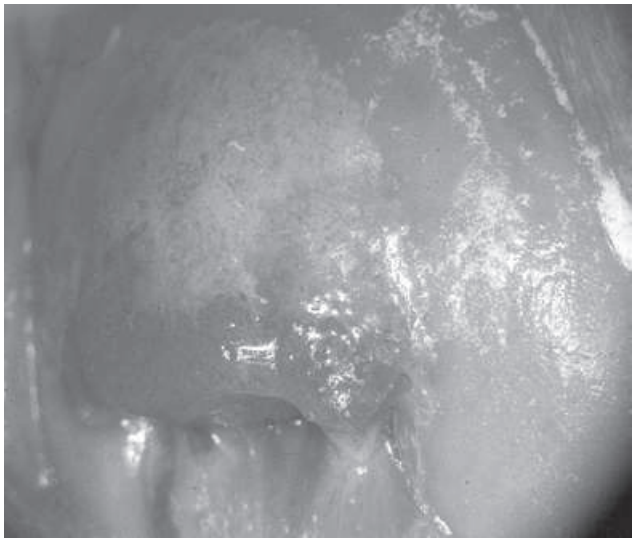

Fig. 9. HPV infection. A bleaching of the epithelium after the acetic acid

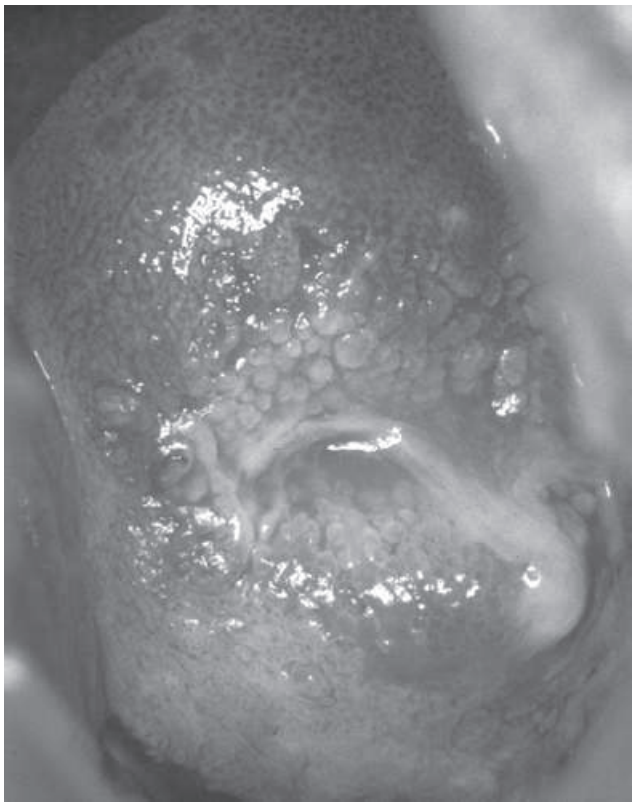

Fig. 10. HPV infection. The epithelium contains a slightly papillary surface

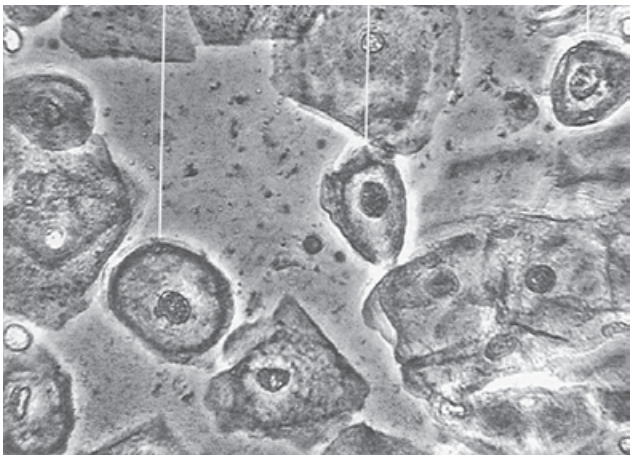

Fig. 11. HPV infection. The unstained cytological smear inspected through the phase-contrast microscope. Koilocytes

mediately. If we simultaneously employ a cytological assessment of the uterine cervix in the phase-contrast microscope, we could save the patient a negative psychical stress associated with a relatively long-lasting expectation for the results of cytological examinations [22, 23].

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