

## **Introduction**

Postcoital bleeding is a bleeding occurring during or immediately after sexual intercourse at a time separated from menstruation. It can be a symptom in women experiencing any type of abnormal uterine bleeding (*Fraser and Petrucco, 1996*).

Although the causes of most cases of PCB are benign changes of the cervix, women with PCB may have serious disease, such as cervical cancer (*Slater DN, 1995*) and the management of patients with PCB remains controversial. The National Health Service Cervical Screening Programme of the United Kingdom (**NHSCSP UK**) recommends that all patients with PCB aged over 40 years should be referred for gynecologic examination, and if cancer is suspected, colposcopy should be performed (**NHSCSP2004**).

PCB alone is not currently an absolute indication for colposcopy. However, women with PCB and negative smears or even no referral smear are often referred to the colposcopy clinic. This is because PCB is often the first presentation of cervical cancer. Colposcopy is an important component of the cervical screening programme and national guidelines for referral have been compiled (*Afsaneh T. et al, 2009*).

Death resulting from cervical cancer is particularly tragic because this type of cancer develops slowly and has a detectable precursor condition which is treatable (*JHPIEGO group, 1997*). In this respect, well-organized screening programs are effective in reducing incidence of and mortality from cervical cancer (*International Agency For Research On Cancer, 1986*).

Traditional screening for cervical cancer is done with papanicolaou smear test, it is the only test known to reduce cervical cancer incidence and its mortality. Data from Nordic countries have shown that well organized cytology screening programs have reduced mortality from cervical cancer by approximately 60% (*WHO, 2006*).

The standard of care for patients with abnormal pap smear results is to perform colposcopy, but if the clinician observes clinical characteristics of suspicious cervix no matter what cytology shows, it is advisable to refer the woman to colposcopic examination (*IARC, 2003*). Colposcopy with directed biopsy is described as the reference investigation or "gold standard" for the diagnosis of cervical precancerous lesions (*Singer et al, 2000*).

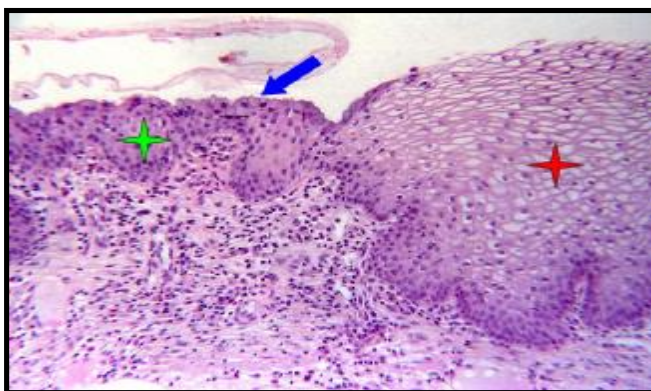
Colposcopy has a reported sensitivity ranging from 87% to 99% to diagnose cervical neoplasia, but its specificity is lower, between 23% and 87% (*Mitchell et al., 1998;Belinson et al., 2001*). According to a study done to evaluate the reliability of cytology and colposcopy as screening methods, reliable cytological screening associated with good colposcopy permits a correct diagnosis with a high reliability (*Rokytaz, 2000*).

### **Anatomy and histology of the cervix:**

The cervical epithelium is derived from two embryologically distinct sources. The part of the cervix that projects into the vagina, called ectocervix or portio, is covered by non-keratinized stratified squamous epithelium similar to that of the vagina. This stratified squamous epithelium is derived from urogenital sinus. In contrast, the endocervical canal is covered by tall mucus-secreting columnar cells that are of mullerian origin. The junction between these two is termed the squamocolumnar junction (*Kistner, 1989*).

***Transformation zone:***

The squamocolumnar junction is defined as the border between stratified squamous epithelium and mucin-secreting columnar epithelium of the endocervix. Morphogenetically there are two different squamocolumnar junctions, one termed original squamocolumnar junction and is the site at which the squamous covering of exocervix abuts the endocervical columnar epithelium at time of birth. Most female babies have columnar endocervical epithelium on the portio surface of the cervix, which forms ectropion or cervical ectopy, overtime it is replaced by metaplastic squamous epithelium. As this occurs the histologic squamocolumnar junction moves towards external os. the newly formed junction is called the physiologic junction. The region between both is called the transformation zone, it is histologically characterized by the presence of metaplastic epithelium (*Kurman, 2002*). This metaplastic area has, for unknown reasons, unique susceptibility to HPV-induced neoplastic transformation, particularly in the anterior and posterior areas (*IARC, 2003*).



**Figure(1):**Transformation zone: normal squamous epithelium (red star), squamous metaplasia (green star), some remaining endocervical cells (arrow) (*Source: Frappart L. et al., 2004*).

## **Four types of epithelial cells can be recognized in cervical smears:**

### ***1-Superficial cells:***

These are shed from the surface of fully mature squamous epithelium which has developed under the influence of oestrogen. They appear as flattened elongated cells with small pyknotic nuclei.

### ***2-Intermediate cells:***

These are oval or navicular cells that are involved in ascending maturation during which nuclear size remains constant while cytoplasmic volume gradually increases.

### ***3-Parabasal cells:***

These are polyhedral cells arranged in irregular mosaic pattern and interconnected by tonofilament-desmosomal complexes. They are found in atrophic smears such as those obtained post-partum or after the menopause.

### ***4-Columnar cells:***

These are basal cylindrical cells with large nuclei and scanty cytoplasm. The basal layer is responsible for epithelial regeneration (*Kistner, 1986*).

## **Cervical cancer precursors:**

Invasive cervical cancers are usually preceded by a long phase of preinvasive disease. This is characterized microscopically as a spectrum of events progressing from cellular atypia to various grades of dysplasia or cervical intraepithelial neoplasia (CIN) before progression to invasive carcinoma.

At first, the term carcinoma in-situ (CIS) was introduced in 1932 to denote those lesions in which the undifferentiated carcinomatous cells

involved the full thickness of the epithelium, without disruption of the basement membrane. Later, in the 1950s the term dysplasia was introduced to designate the cervical atypia that is intermediate between the normal epithelium and CIS. The term cervical intraepithelial neoplasia (CIN) has therefore been introduced to unite the previous terminology and to denote the whole range of cellular atypia confined to the epithelium (*IARC, 2003*).

A judgement of whether or not a cervical tissue specimen reveals CIN is dependent on the histological features concerned with differentiation, maturation and stratification of cells and nuclear abnormalities. Mitotic figures are seen in cells that are in cell division, they are infrequent in normal epithelium and if present, they are only seen in the parabasal layer. As the severity of the CIN increases the number of mitotic figures also increases, they may be seen in the superficial layers of the epithelium (*Kurman, 2002*).

Cervical intraepithelial neoplasia is graded according to the proportion of the epithelium occupied by undifferentiated cells. In CIN 1 (corresponding to mild dysplasia) only the basal third is occupied by undifferentiated cells whilst if such cells occupy between one-third and two thirds of the epithelial thickness, the lesion is classified as CIN 2 (corresponding to moderate dysplasia). If more than two thirds of the epithelium thickness is occupied by the undifferentiated cells then that will be CIN 3, those conditions previously categorized as severe dysplasia or carcinoma in-situ (*Fox and Buckley, 1982*). Most low-grade CIN lesions (CIN 1) regress within relatively short periods whereas high-grade CIN carries a much higher probability of progressing to invasive cancer (*IARC, 2003*).

The precursor lesion arising from the columnar epithelium is referred to as adenocarcinoma in-situ (AIS). AIS may be associated with CIN in one-to two-thirds of cases (*IARC, 2003*).

**Screening for Cancer Cervix:**

Exfoliative cytology is the commonest way of diagnosing pre-invasive cervical lesions, other methods include HPV DNA testing, screening colposcopy, visual inspection with acetic acid (VIA), visual inspection with lugol's iodine (VILI) and the newer and still experimental methods based on real-time imaging and tumour markers (*IARC, 2003*). A study done in the united kingdom- which included 11,085 women – showed that regarding the ability to detect cervical cancer and its precursors, conventional cytology had sensitivity 77% and specificity 96% (*Cuzick et al., 2003*).

In general, women with abnormal cytological findings are referred for colposcopic evaluation, the referral criteria vary from one country to another. After colposcopic diagnosis, a punch biopsy may be taken to confirm the diagnosis or immediate treatment may be instituted without prior histological confirmation of the disease, the so called “see and treat” approach (*IARC, 2003*).

Colposcopy has a reported sensitivity ranging from 87% to 99% to detect cervical neoplasia, but its specificity is lower, between 23% and 87% (*Mitchell et al., 1998; Belinson et al., 2001*). According to *IARC, 2003* colposcopy should not be considered a diagnostic method but an investigative technique which allows the evaluation of the extent of the lesion and the localization of the SCJ, contributing to the reduction of the incidence of invasive cancer. Additionally, colposcopy directs the diagnostic biopsies and the treatment in cases appropriate for out-patient management of cervical lesions.