HERPES SIMPLEX VIRUS TYPE 2 (HSV-2) PROTEINS IN ORAL SQUAMOUS CELL CARCINOMA: IN-SITU DETECTION

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ABSTRACT

The present study was conducted in an attempt to search for possible presence of HSV-2 protein in 21 lesional tissues of oral squamous cell carcinoma, as well as in normal oral mucosa, using immunohistochemical peroxidase-antiperoxidase (PAP) technique. Specimens of normal oral mucosa revealed frequent positive staining for polyclonal HSV-2 protein marker thus indicating that HSV-2 is not an uncommon inhabitant of the oral mucosa. Only highly differentiated grades of oral squamous cell carcinoma showed positive staining for HSV-2, while less differentiated carcinomas failed to reveal any immunoreactivity. This raised the suggestion of a possible causative role played by HSV-2 in the establishment of the neoplastic process in oral squamous cell carcinoma through a "hit and run" mechanism. Verrucous carcinoma showed deep intra-epithelial blister formation containing positively-stained koilocytes for the HSV-2 marker. The present results point to HSV-2 as a promoter or an initiator in early neoplastic changes in well differentiated oral squamous cell carcinoma that becomes denatured and consequently not evident in less highly differentiated tumours.

INTRODUCTION

Among the viruses with complete double stranded DNA, the herpes simplex virus family (HSV) is well recognized(5). This is an ubiquitous group producing primary infections and later periodic episodes of recurrent infections in tissues derived from ectoderm(20).

A characteristic of herpes viruses is that they reside latently in regional autonomic sensory ganglionic neurons and, at least in animals, can be oncogenic(1··2,26). Extraneural sites may also harbour HSV(6,21).

An important finding is that reactivation of the virus is not always accompanied by epithelial lesions. Therefore, epithelial cells can be repeatedly exposed to HSV without being killed, and the long-term effects of this are not known(6).

Two major types of herpes simplex virus are recognized; HSV-1 and HSV-2. The distinction between the two types is based on the differences in the aspects of pock formation by HSV on chorioallantoic membrane of infected eggs(8,22), as well as on antigenic differences(9). The site specificity, i.e. upper body lesions by HSV-1, and lower body lesions by HSV-2 is apparently not as strict as originally thought, and is furthermore decreasing(4,15).

The capacity of both the HSV-1 and HSV-2 genomes to induce cell transformation in vitro in a variety of species including man has been reported(23). It has also been reported that HSV infection induces chromosomal aberrations, mutations and selective DNA amplification(18,27).

HSV type-2 is known to be somewhat more virulent than type-1 and, significantly, has been associated repeatedly with carcinoma of the uterine cervix, suggesting a possible cause and effect relationship(29). Cultures of proliferating explanted normal human oral epithelium revealed that epithelial cells were permissive for both HSV-1 and HSV-2(11).

Although more oral herpetic infections are caused by HSV-1 than by HSV-2, yet the association between cancer of the head and neck and HSV-1 has always rested on tentative evidence based on serum studies(7). Monoclonal antibodies have been used in some tissue studies but have so far failed to identify any known HSV-1 protein in oral cancers(12,16).

Biologic similarities of these viruses and the similarity of the cervical and oral mucosae lend strong support to the possibility of common aetiological agents of neoplastic transformation(17).

The present study was therefore designed to search for the possible presence of HSV-2 proteins in lesional tissue of oral squamous cell carcinoma (OSCC) as well as normal oral mucosa using the immunohistochemical peroxidase-antiperoxidase (PAP) technique.

MATERIAL AND METHOD

Cases

This study has been conducted on a total of 27 tissue specimens including 21 diagnosed cases of OSCC and 6 biopsy specimens from site and age matched persons.

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