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Polycyclic aromatic hydrocarbons: is there an association with squamous cell carcinoma of the oesophagus in South Africa?

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Abstract

Background

Oesophageal squamous cell carcinoma (OSCC) is the eight most common cancer diagnosis globally. The disparity in incidence worldwide is poorly understood. The developing world has rising numbers and poor outcomes because of the nature of the disease and late presentation. Polycyclic aromatic hydrocarbons (PAH) have been identified as a potential driver of incidence in other endemic areas. In South Africa, there is a paucity of data on the association of PAH with OSCC.

Objectives

To determine the urine concentration of PAH in patients with newly diagnosed OSCC, compared to controls presenting to an endoscopy clinic. Demographic data were collected to identify potential sources of exposure in both groups.

Methods

A prospective case-control study was performed at the Endoscopy Unit of the Charlotte Maxeke Johannesburg Academic Hospital. Informed consent was obtained from newly diagnosed cases of OSCC and control patients without OSCC. Demographic data were obtained, and a urine specimen was collected. Urine concentrations of 1-hydroxypyrene as an indirect marker for PAH, were measured.

Results and Discussion

The case and control groups were matched for age and gender and no statistical significance was found with respect to demographic characteristics and personal areas of PAH exposure.1-Hydroxypyrene was detected in 9/20 cases and 3/20 control patients ($p=0.035$). Furthermore, on univariate analysis, having a PAH level detected has an OR=4.65 (3.5) of having OSCC. These data suggest an association between PAH exposure in OSCC patients.