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Letter to the Editor

Is Alcohol Intolerance in Cancer Patients Explained by Tumour Production of Alcohol Dehydrogenase?

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ALCOHOL INTOLERANCE in patients with cancer has been particularly thoroughly documented by Brewin [1, 2] but the cause remains unknown. It characteristically occurs after ingestion of only small amounts of alcohol. It is by no means confined to patients with Hodgkin's disease or to pain. It has been speculated that there might be elaboration of a disulfiram-like substance by tumour [1].

The systemic intolerance to small amounts of alcohol encountered in some cancer patients is indeed similar to that encountered in patients who take alcohol after disulfiram (antabuse). This drug blocks acetaldehyde dehydrogenase causing acetaldehyde accumulation after the ingestion of alcohol.

If acetaldehyde is responsible for systemic intolerance to alcohol in cancer patients it is reasonable to speculate that local pain could result from pressure from an increased tumour volume caused by acetaldehyde mediated vascular effects or from a direct chemical effect of acetaldehyde on nerve endings.

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Tumour production of alcohol dehydrogenase is a more logical explanation for any accumulation of acetaldehyde than the elaboration of a disulfiram-like substance. In particular this seems a more attractive explanation for localized pain, given that the metabolism of alcohol (and hence the production of acetaldehyde) normally takes place largely in the liver. Tumour production of alcohol dehydrogenase would be expected to result in much higher local concentrations of acetaldehyde than the release of a disulfiram-like substance into the circulation, particularly in the lack locally of normal liver enzymes required for the breakdown of acetaldehyde. This lack in some patients could result in the escape of significant amounts of acetaldehyde into the circulation and systemic toxicity.

Large amounts of an unusual lactate dehydrogenase are expressed in many human cancers [3]. Genetic derepression allowing the production of an alcohol dehydrogenase appears feasible. It is possible to identify alcohol dehydrogenase in small amounts of tissue [4] but unfortunately it has not proved possible to test this hypothesis locally.

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