Topical immunotherapy with dinitrochlorobenzene: Safety concerns

Sir,

We read with ardent interest the letter to the editor by Mohan et al. in a recent issue of IJDVL.[1] However, we would like to express our strong reservations about the usage of dinitrochlorobenzene (DNCB) despite its observed efficacy in view of the safety issues associated with it.

As established beyond doubt several years ago, DNCB is an inherently mutagenic compound.[2] Its mutagenicity was demonstrated at all concentrations in the Salmonella typhimurium plate assay.[3,4] The assay is an invaluable screening test with a high qualitative correlation (90%) between mutagenesis and carcinogenesis.[3]

In addition, DNCB depletes the activity of glutathione S transferase in rat skin, blocking an important detoxification system of mammalian cells,[5] and is found to be genotoxic by sister chromatid exchange in human skin fibroblasts.[6] Moreover, DNCB has a significant systemic absorption.[7]

All the significant trials concerning DNCB have been performed before the year 1990 and there has been a steady decline in enthusiasm and publications on the use of DNCB in benign disorders of the skin after the discovery of its mutagenic potential. Therefore, in view of the possible risks involved with DNCB and the availability of newer alternative potent contact allergens, the use of DNCB to treat benign skin diseases is to be abandoned until proper carcinogenicity tests are conducted and the question of its hazard is resolved.[8]

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Letters to the Editor


Dear Sir,

We appreciate your interest in our letter. We know, beyond doubt, that dinitrochlorobenzene (DNCB) has shown mutagenicity in the Ames test with the salmonella typhimurium plate assay. The Ames test is used to test a chemical/drug for mutagenicity, and is named after its developer, Bruce Ames.

The use of the Ames test is based on the assumption that any substance that is mutagenic (for the bacteria used in this test) may also turn out to be a carcinogen. Although, in fact, some substances that cause cancer in laboratory animals (Dioxin, for example) do not give a positive Ames test (and vice-versa).

However, drugs like norfloxacin, Isoniazid, and PUVA (psoralen), textile dyes, and fumes of oils have also been found to be mutagenic by the Ames test. Nevertheless, these drugs and chemicals are widely used worldwide. The most potent mutagenic agent in the early trials of the Ames test is parsnip juice. DNCB was found to be noncarcinogenic when fed in large doses to rats, mice, guinea pigs, and man.

The immunomodulatory effects of topical DNCB are well known and can be used in patients with HIV, verruca vulgaris, verruca plana and recurrent warts, and nodular prurigo. DNCB therapy is being used in HIV patients for the last 10 years, and the only reported toxicity has been localized dermatitis at the application site.

On account of unknown etiology and an unpredictable course, treatment of alopecia areata is palliative. Topical immunotherapy by contact sensitizers is an effective and accepted therapeutic modality in the treatment of chronic severe alopecia areata. Treatment with dinitrochlorobenzene is cost-effective, its response rate varies from 60 – 80%, it is easy to apply, and is painless, with easily tolerable side effects. However, both DPCP (Diphenyl cyclopropenone) and SADBE (squaric acid dibutyl ester) are expensive.

To conclude, DNCB remains a useful contact sensitizer in alopecia areata and warts.

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