EFFECT OF SOME SURFACTANTS ON THE SOLUBILITY AND DISSOLUTION RATE OF CLIOQUINOL AND DI-IODOHYDROXYQUINOLINE

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The occurrence of neurotoxic reactions following oral administration of halogenated hydroxyquinolines has been reported (Oakley, 1973). Whether the toxic symptoms were due to genetic factors, duration of administration or formulation effects remain to be established. Clioquinol and di-iodohydroxyquinoline tablets often contain dispersing agents to aid wetting of the hydrophobic drugs. A brand of clioquinol tablets (Entero-Vioform tablets) contains a synthetic surfactant (sapamine) as a wetting agent. The systemic absorption in man of clioquinol, administered as a powder with 7% sapamine, has been confirmed (Jack & Riess, 1973). Also, surfactants influence the dissolution and absorption of certain drugs (Gibaldi & Feldman, 1970). Accordingly, we have examined the influence of sodium lauryl sulphate (SLS), sodium desoxycholate (SDC), dioctyl sodium sulphosuccinate (DSS) and sapamine (NN-diethyl-N-stearoyl ethylenediamine) on the solubility and dissolution rate of clioquinol and di-iodohydroxyquinoline. Solubility experiments were made at 37° in the presence of varying concentrations of the surfactants. Water was used as the medium for SLS, SDC and DSS and 0.1N HCl for SLS and sapamine. See Fig. 1.

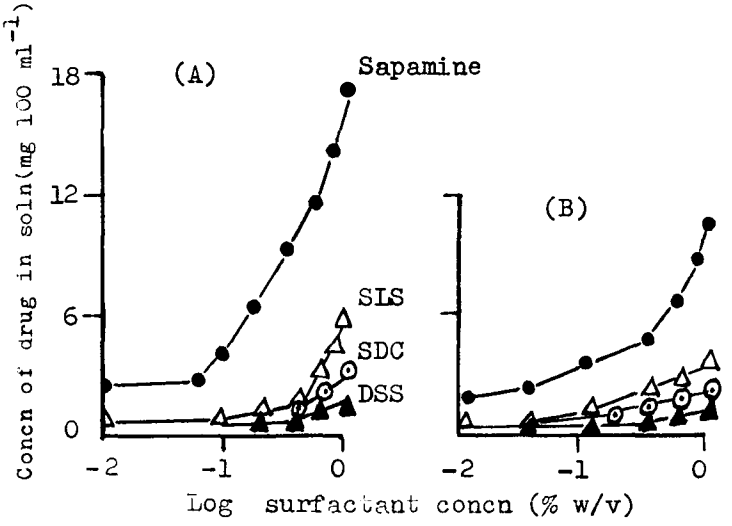

Fig.1. Showing the effect of some surfactants on solubility of clioquinol (A) and di-iodohydroxyquinoline (B) at 37° in 0.1N HCl for sapamine and in water for other surfactants.

In 0.1N HCl SLS showed a much greater solubilizing effect. In 0.6% w/v of this surfactant clioquinol and di-iodohydroxyquinoline were solubilized to the extents of 96.2 and 26.0 mg 100 ml^{-1}, respectively. Measurements of the intrinsic dissolution rates of compressed discs were carried out in 0.1N HCl containing varying concentrations of SLS. The presence of the surfactant increased the rate; for clioquinol about 18-fold increase occurred in the presence of 0.2% SLS. Dissolution rate experiments of clioquinol tablets (two brands) were made at 37° in 0.1N HCl. The brand with sapamine as a wetting agent had a relatively faster dissolution rate than the brand with no wetting agent.

Gibaldi, M. & Feldman, S. (1970). J. Pharm. Sci., 59, 579-589.
Jack, D.B. & Riess, W. (1973). Ibid., 62, 1929-1932.
Oakley, G.P. Jr. (1973). J. Am. med. Ass., 225, 395-397.