

Abstract:

PolyDADMAC (Polydiallyl-Dimethyl Ammonium Chloride) and Alum (Aluminium Sulphate) were the chemical agents used for potable water flocculation in Khartoum State. The response of New Zealand rabbits to drinking water treated with alum and polyDADMAC in terms of serum changes in electrolytes was studied. Six New Zealand rabbits of balanced sexes were purchased, clinically adapted for two weeks and divided into 2 groups, control (group 1) and test (group 2). The test group was orally given a dose of 1% polyDADMAC and 1% alum in a blend ratio of 1:2, respectively, for an experimental period of 10 weeks. Test chemicals blend was similar to the dose applied by Khartoum Water Plant, during flood season, for human consumption. Sera were analyzed for electrolytes prior to the experiment and, thereafter, at weekly intervals. Serum calcium, phosphorus, iron and magnesium levels showed remarkable ( $P \leq 0.01 - 0.001$ ) decreases compared to the control, the fact which can be attributed to the hepatic damage induced by test chemicals. Sodium and potassium levels were not determined. The test group had significantly ( $P \leq 0.01$ ) low iron that can be attributed to the direct effect of alum. Intestinal wall with spotted white colour (probably due to alum causing focal enteritis), was greatly affected with the irritant alum and/or its metabolites. When the ion-exchanged resin was used to remove poisons from water, it precipitated by alum. It is more apt to gripe; the salt intensifies the action of resin and hence produces the hydragogue effect. This action was very clear in the congested mesenteric blood vessels and was symptomatically manifested by diarrhoea and salivation due to nausea. Alum and polyDADMAC which are currently used in potable water treatment in Khartoum State, proved toxic to New Zealand rabbits in terms of changes in electrolytes coupled with enteropathies.