

Excessive alcohol consumption is a major health hazard worldwide. Alcohol is commonly used and often abused in Kenya, especially by the youth. For European, Asian, Australian and American populations, studies have shown linkage between polymorphisms of the alcohol dehydrogenase (ADH) and aldehyde dehydrogenase (ALDH), the ethanol metabolizing enzymes, with the increase of alcohol intake. For Africans, no studies on heterogeneity of ADH and ALDH and its relationship to alcoholism, alcohol intake and alcohol drinking behaviour have been reported. The aim of this study was to find out the distribution of alleles of ADH 2, ADH 3, and ALDH 2 loci in the selected Kenyan populations namely the Kolweny, Siaya, Longisa, Limuru and Rugunga and to investigate the association of these ADH/ALDH alleles with alcohol drinking and alcoholism. These five Kenyan populations represent two major African groups namely the Bantu and Nilotes. Different gender and age groups of the selected Kenyan communities were screened for ADH 2, ADH 3 and ALDH 2 polymorphisms via phenotyping of hair lysates using high resolution isoelectric focusing. In addition, information on education, marital status, occupation, drinking behaviour, alcohol sensitivity, alcohol intake, age of regular alcohol drinking, alcohol drinking experience, alcohol dependence, emotional response to alcohol and preference of alcoholic drinks was collected via a questionnaire. The data obtained on ADH 2, ADH 3 and ALDH 2 polymorphism and alcohol drinking behaviour was statistically analyzed using chi-square, t-test and Fisher's exact test. Three hundred and seventy one adult volunteers participating in the project from all Kenyan study groups were divided into groups on the basis of alcohol tolerance. Alcohol-drinking parameters of alcohol use were analyzed with respect to alcohol tolerance. The significant difference in alcohol intake, alcohol drinking experience, alcohol sensitivity, emotional response to alcohol, the role of ADH 3*1 allele in the drinking behaviour and preference of alcoholic drinks were determined among individuals with high and low alcohol tolerance. ADH 2, ADH 3 and ALDH 2 polymorphism showed significant relation to alcohol intake (among alcoholics), alcohol drinking experience (among nonalcoholics), sensitivity to alcohol, alcohol drinking behaviour, mode of alcohol drinking, and preference of alcoholic drinks. ADH and ALDH heterogeneity was not associated with the difference in alcohol intake (among nonalcoholics), age of regular drinking and emotional response to alcohol. The role of different socio-demographic, biochemical and genetic factors in alcohol drinking and spread of alcoholism were identified for each Kenyan study group. The Kolweny, Siaya, Limuru and Rugunga populations have dominance of individuals with high alcohol tolerance and relatively low spread of alcoholism in the populations. The Longisa population had relatively high proportion of individuals with low alcohol tolerance and high occurrence of alcoholism in the community. The research findings may be used to formulate ethnically adequate methods of diagnosis, treatment, and management of alcoholism in relation to alcohol tolerance in the studied Kenyan populations