

WORLD CONGRESS ON RHEUMATIC HEART DISEASE

2-4 November 2023 • Abu Dhabi



Submission Id: 41

Title: FACTORS ASSOCIATED WITH SEVERITY OF RHEUMATIC HEART DISEASE AMONG PATIENTS IN MOI TEACHING AND REFERRAL HOSPITAL, KENYA, 2020

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Background & Aims: Africa experiences a more malignant course of Rheumatic Heart Disease (RHD), with Sub-Saharan Africa having a higher burden, reporting a loss of 10.7 million daily adjustable life years (DALYs). Severe RHD and virulent forms of rheumatic fever are seen mainly in the early ages of life, leading to high mortality and morbidity, overstretching the patient's financial needs in its management. The pathogenesis of RHD is well understood, but variation in its natural history and severity remains unexplained. We sought to determine the epidemiologic factors associated with the severity of RHD and assess various co-morbidities among RHD patients.

Methods: A 1:1 case-control study, with cases defined as patients with severe valvular disease or mechanical prosthetic valves/valve repairs; controls were those diagnosed with either Moderate, Mild or Inactive RHD, all confirmed by echocardiography. Participants sampled were 110, out of the estimated 976 RHD patients attending the cardiac clinic. Information was collected using face-to-face structured questionnaires and patient files. Dependent variables were the cases and controls, independent variables included socio-demographic and epidemiologic data. Measures of central tendency and dispersion were used in the descriptive analysis of continuous variables, and categorical variables were analyzed using frequencies and proportions. Bivariate analysis used odds ratios (OR) at a Confidence Interval of 95%, and a P-value of ≤ 0.05 was considered a significant risk factor. Factors with a P-value of ≤ 0.2 were subjected to a multivariate analysis using unconditional logistic regression and significance was considered on factors with a P-value of ≤ 0.05 .

Results: The mean age among the cases was 35 (SD \pm 11.4), and 27 (SD \pm 11.3) among the controls, with the female cases and controls being 72.5% and 68% respectively (OR=1.3; P=0.34). A majority of the cases did not practice regular physical exercise (69%) (OR=2.3; P=0.0344), while 51% of the controls practised regular physical exercise (OR= 0.43; P= 0.0215). The Body Mass Index (BMI) of overweight and obese ranges among the adult cases, were 43.7%, with 90% of them being female. The proportion of cases with a family history of chronic illness was 78.2% (OR=8.02; P=<0.0001), heart disease being the most common form of chronic illness in their family history. The participants' socioeconomic status showed that 11.6% of the cases were unemployed, with only 2.4% of the controls being unemployed (OR= 6.61; P=0.05). The cases and controls with a previous history of alcohol intake were 20% and 1.8%, respectively (OR=13.6; P=0.0144). Among the cases, 25% had comorbidities, while 12.7% of the controls had comorbidities (OR=2.342; P=0.0949), the most common comorbidities were stroke and hypertension, with over 50% of the cases having either of the two comorbidities. Among the cases, 16% of them had high blood pressure (systolic \geq 140mmHg), and only 10% among the controls had high blood pressure (OR= 1.6; P=0.04). Of the female participants on contraceptives, 23% were cases while 20% were controls (OR=1.24; P=0.04). Multivariate analysis revealed that occupation, alcohol use and lack of regular exercise remained significant with P values of 0.000217, 0.000007, and 0.021 respectively.

Conclusions: Severe RHD is increased among young adults and females. Low socioeconomic status and harmful use of alcohol are major drivers in increasing RHD severity progression. Regular physical exercise is a protective factor in preventing severe RHD. Contraceptive use and severe RHD have a slight correlation, although further studies on this are needed. We recommend improving national literacy and awareness of RHD, further incorporating this into routine reproductive health service provision, advocacy for affordable and accessible health needs for the indigent, and adoption of multisectoral interventions to promote behavioural change on alcohol use and physical exercise among people living with RHD.