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Title: SCREENING FOR RHEUMATIC HEART DISEASE IN FIRST DEGREE RELATIVES OF RHD PATIENTS IN NEPAL

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Background & Aims: Rheumatic heart disease (RHD) is associated with significant morbidity and mortality, particularly in lower- and middle-income countries. First-degree relatives (FDR) of RHD patients share known risk factors for RHD: poverty, poor living conditions, crowding, poor hygiene, and potential shared genetic characteristics that lead to higher RHD risk. Prior screening efforts in Nepal have been limited to examining children in schools and have yielded a prevalence of 0.1%-3.7% for borderline or definite RHD. We sought to determine whether FDR screening would be a high-yield method of RHD screening to allow for timely preventive measures.

Methods: We conducted a cross-sectional study based in two tertiary care centers in Nepal. RHD cases (n=102) were given the opportunity to invite their FDRs for RHD screening. A total of 234 FDRs without clinically recognized RHD participated in the RHD screening. FDRs were screened using echocardiography by cardiologists at the two sites and RHD was adjudicated by a committee of US based cardiologists and sonographers according to the World Heart Federation classification of Definite or Borderline RHD. We assessed prevalence of RHD among FDRs and compared them with prior school-based screening methods in Nepal. We examined whether index case characteristics (age, sex, socio-economic status (SES) or family history of having RHD) were associated with likelihood of index case having at least one FDR with borderline or definite RHD using multi-variable adjusted logistic regression.

Results: The mean ages of the 102 index RHD cases and of the 234 FDRs were 29.6 (range 10-63) and 29.0 (range 5-80) years, respectively. 74% of the RHD cases and 58% of the FDRs were women. Among the 234 FDRs, 19 (8.1%; 95% CI 5.1%-12.6%) had borderline or definite RHD of which 8 (3.4%; 95% CI 1.6%-6.9%) were definite RHD. Of the 102 index cases participating in this study, 17.6% had at least one FDR with borderline or definite RHD. Index case age, sex, and SES were not associated with likelihood of having an FDR screen positive for RHD. While family history of RHD tended to be associated with a five-fold higher odds of having an FDR screen positive for RHD (age and sex-adjusted odds ratio 4.90; 95% CI 0.87-27.5), confidence intervals were wide due to few index cases having a known RHD family history. Of the 52 child-parent relationships where the index case was the child, no parent had borderline or definite RHD. Of the 111 sibling-sibling relationships, 8 FDRs (12.5%) screened positive for borderline or definite RHD. Of the 71 parent-child relationships where the index case was the parent, 11 children (15.5%) screened positive for borderline or definite RHD.

Conclusions: Our study demonstrates that screening FDRs of known RHD cases is a high-yield method of identifying previously unrecognized RHD. Identification of FDRs with RHD can encourage these patients to receive earlier treatment with penicillin prophylaxis to prevent further reinfection and valvular damage. Coupled with a penicillin prophylaxis program, adoption of FDR screening into the national RHD screening strategy in RHD-endemic countries like Nepal could improve RHD care worldwide.