

Publication

Association between footwear use and neglected tropical diseases : a systematic review and meta-analysis

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BACKGROUND: The control of neglected tropical diseases (NTDs) has primarily focused on preventive chemotherapy and case management. Less attention has been placed on the role of ensuring access to adequate water, sanitation, and hygiene and personal preventive measures in reducing exposure to infection. Our aim was to assess whether footwear use was associated with a lower risk of selected NTDs. **METHODOLOGY:** We conducted a systematic review and meta-analysis to assess the association between footwear use and infection or disease for those NTDs for which the route of transmission or occurrence may be through the feet. We included Buruli ulcer, cutaneous larva migrans (CLM), leptospirosis, mycetoma, myiasis, podoconiosis, snakebite, tungiasis, and soil-transmitted helminth (STH) infections, particularly hookworm infection and strongyloidiasis. We searched Medline, Embase, Cochrane, Web of Science, CINAHL Plus, and Popline databases, contacted experts, and hand-searched reference lists for eligible studies. The search was conducted in English without language, publication status, or date restrictions up to January 2014. Studies were eligible for inclusion if they reported a measure of the association between footwear use and the risk of each NTD. Publication bias was assessed using funnel plots. Descriptive study characteristics and methodological quality of the included studies were summarized. For each study outcome, both outcome and exposure data were abstracted and crude and adjusted effect estimates presented. Individual and summary odds ratio (OR) estimates and corresponding 95% confidence intervals (CIs) were calculated as a measure of intervention effect, using random effects meta-analyses. **PRINCIPAL FINDINGS:** Among the 427 studies screened, 53 met our inclusion criteria. Footwear use was significantly associated with a lower odds of infection of Buruli ulcer (OR = 0.15; 95% CI: 0.08-0.29), CLM (OR = 0.24; 95% CI: 0.06-0.96), tungiasis (OR = 0.42; 95% CI: 0.26-0.70), hookworm infection (OR = 0.48; 95% CI: 0.37-0.61), any STH infection (OR = 0.57; 95% CI: 0.39-0.84), strongyloidiasis (OR = 0.56; 95% CI: 0.38-0.83), and leptospirosis (OR = 0.59; 95% CI: 0.37-0.94). No significant association between footwear use and podoconiosis (OR = 0.63; 95% CI: 0.38-1.05) was found and no data were available for mycetoma, myiasis, and snakebite. The main limitations were evidence of heterogeneity and poor study quality inherent to the observational studies included. **CONCLUSIONS/SIGNIFICANCE:** Our results show that footwear use was associated with a lower odds of several different NTDs. Access to footwear should be prioritized alongside existing NTD interventions to ensure a lasting reduction of multiple NTDs and to accelerate their control and elimina-

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