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Prevalence and Epidemiological Factors Involved in Cellulitis with Lymphangitis Among Patients with Diabetic Foot Ulcer Disease, Dar es Salaam, Tanzania.

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ABSTRACT

Background / Aim: Among patients attending a large diabetes clinic, cellulitis has been a well-recognized problem in those with foot complications. Patients with poorer outcomes appear to have concomitant lymphangitis with cellulitis. However, the epidemiology and clinical implications of lymphangitis have not been characterized in Africa. We carried out this study to (i) characterize the epidemiology of lymphangitis in a large patient cohort; (ii) identify risk factors associated with lymphangitis; and (iii) ascertain the effect of lymphangitis on outcome in this patient population.

Method: This was a retrospective cohort study of all patients who attended the diabetes clinic in Dar es Salaam during January 2017 to December 2019 (study period). Following informed consent, we recorded history and epidemiologic details followed by physical examination. Data were entered in a standardized questionnaire and analyzed with Epi Info statistical software (CDC, Atlanta, GA). Relative Risk (RR) and 95% confidence intervals (CI) were calculated.

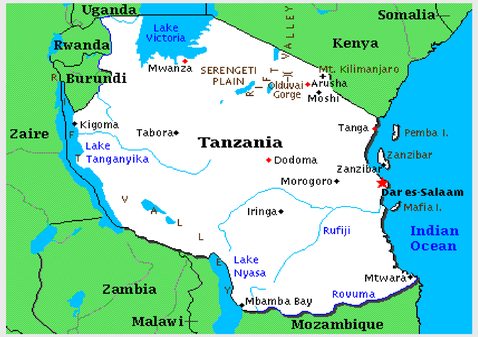
Results / Discussion: During the study period, 1698 patients participated in the study; 1084 (64%) were male, and 457 (27%) had lymphangitis and cellulitis. Median age: 58 (range 17-97) years; median BMI: 26 (range 13-60) kg/m^2. Lymphangitis was significantly associated with non-healing of ulcers (RR: 1.4; CI: 1.1-1.7, P<0.01) or having to undergo lower limb amputation (RR: 1.8; CI: 1.4-2.2, P<0.001). Although patients with lymphangitis were more likely to die (RR=1.4), the difference was not statistically significant. Of note, patients without peripheral arterial disease were significantly more likely to acquire lymphangitis (RR: 1.5; CI: 1.2-1.8, P <0.001).

Conclusion: The prevalence of lymphangitis complicating diabetic foot ulcer disease in Tanzania is 27%. Moreover, patients with lymphangitis were more likely to have worse outcomes, such as amputation or death. The association of lymphangitis with delayed healing suggests infections are playing a greater role in the pathogenesis of foot ulcer disease and remains underappreciated.

BACKGROUND

- Incidence and prevalence of diabetes mellitus increasing in Tanzania
- Incidence of diabetic foot ulcers increasing in parallel over the past three decades
- Cellulitis is a recurring problem in patients with foot complications who attend diabetes clinic
- Patients with poorer outcomes appear to have concomitant lymphangitis with cellulitis
- Epidemiology and clinical implications of lymphangitis have not been characterized in Africa

TANZANIA



- Dar es Salaam: the largest city in Tanzania
- Muhimbili National Hospital—main referral medical center and largest hospital in the country (>3000 beds)
- Busy diabetes outpatient service: >5000 pts per year
- Catchment area: >7 million people:
  - Africans
  - Indian Asians
  - Arabs

OBJECTIVE

- To characterize the epidemiology of lymphangitis in a large patient cohort
- To identify risk factors associated with lymphangitis
- To ascertain the effect of lymphangitis on outcome in this patient population

METHODS

- Jan 2017 –Dec 2019 (study period)
- Evaluated diabetes patients with foot ulcers
- Informed consent obtained
- Detailed clinical and epidemiologic data recorded
- Social habits and patients outcomes documented
- Comprehensive physical examination carried out
- Data entered in standardized questionnaire and analyzed with Epi Info statistical software (CDC, Atlanta, GA).
- Relative Risk (RR) and 95% confidence intervals (CI) were calculated
- Logistic regression was performed and adjusted odds ratio (AOR) determined

RESULTS

- 1698 patients participated in the study
- 1084 (64%) were male
- 457 (27%) had lymphangitis and cellulitis
- Median age: 58 (range 17-97) years
- Median BMI: 26 (range 13-60) kg/m^2

RESULTS

- Lymphangitis was significantly associated with non-healing of ulcers (RR: 1.4; CI: 1.1-1.7, P<0.01) or having to undergo lower limb amputation (RR: 1.8; CI: 1.4-2.2, P<0.001)
- Although patients with lymphangitis were more likely to die (RR=1.4), the difference was not statistically significant
- Of note, patients without peripheral arterial disease were significantly more likely to acquire lymphangitis (RR: 1.5; CI: 1.2-1.8, P <0.001)

CONCLUSIONS

- The prevalence of lymphangitis complicating diabetic foot ulcer disease in Tanzania is 27%. Moreover, patients with lymphangitis were more likely to have worse outcomes, such as amputation or death
- Bacteria in lymphangitis enter circulation via the lymphatics which is a significant factor in the pathogenesis of secondary bacteremia
- Treatment of lymphangitis should therefore be aggressive with IV antimicrobial therapy initially
- The association of lymphangitis with delayed healing suggests infections are playing a greater role in the pathogenesis of foot ulcer disease and remains underappreciated

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