



ORIGINAL ARTICLE

Necrotizing soft-tissue infections in New Caledonia: Epidemiology, clinical presentation, microbiology, and prognostic factors



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Summary *Background/Objectives:* Necrotizing soft-tissue infections (NSTIs) are severe and rapidly progressive infectious conditions. We herein describe the clinical characteristics, microbiology, and prognosis factors of NSTIs in New Caledonia.

Methods: All patients admitted for confirmed NSTIs at the only surgical facility in New Caledonia from January 2008 to July 2013 were retrospectively included. Factors associated with mortality were analyzed by multivariate risk regression.

Results: Over the period under review, 67 patients were studied (annual incidence rate, 6.1/year/100,000 inhabitants). The overall mortality rate was 24%. Melanesian people ($n = 47$; 70%) were more affected than other ethnic groups ($n = 20$; 30%; $p = 0.001$). The mean age was 54 years, and men were predominantly affected ($n = 46$; 69%). The most common comorbidity reported was diabetes mellitus ($n = 24$; 36%). Nonsteroidal anti-inflammatory intake prior to admission was reported in 14 cases (21%). Lower limbs were the most commonly affected anatomical sites ($n = 36$; 54%). At least one pathogen was identified in 31 cases (46%), whereas polymicrobial flora was found in 26 cases (39%). No bacteria were isolated in 10 cases (15%). *Streptococcus pyogenes* was the most frequently isolated bacterium ($n = 21$; 32%). Factors associated with mortality were use of norepinephrine [odds ratio (OR) 25.6; 95% confidence interval (CI) 4.8–135.8] and presence of two comorbidities (OR 8.6; 95% CI 1.7–42.3).

Conflicts of interest: All contributing authors declare no conflicts of interest.

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Conclusion: NSTIs are particularly frequent in New Caledonia. Local health care workers should have a high index of suspicion for the disease to initiate surgical and medical treatments early.

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1. Introduction

Necrotizing soft-tissue infections (NSTIs) are severe and rapidly progressive infectious conditions, which depending on the clinical form can involve subcutaneous tissues, fascias, and/or muscles.¹ Management of NSTIs relies on rapid surgical debridement and broad-spectrum antibiotic therapy.² Precocity of diagnosis is one of the main prognosis factors.³ However, the early stages of the disease are often misdiagnosed due to the absence of specific clinical features. In addition, several other factors have been shown to influence mortality, including underlying condition, advanced age, or bacterial virulence, such as invasive group A *Streptococcus*.⁴ The objectives of this study are to describe the epidemiology, clinical presentation, and microbiological characteristics of this condition in New Caledonia and to evaluate the determinants of mortality associated with this surgical emergency.

2. Methods

2.1. Setting

New Caledonia is a French-administered overseas territory in the South Pacific. The indigenous Melanesian community represents 45% of the 252,000 inhabitants.⁵ Half of the population lives in the capital city of Nouméa. The population has good access to the health care system of European standards. People diagnosed with severe infections in New Caledonia are usually referred to the single tertiary center (482 beds) based in Nouméa. The climate in New Caledonia is marked by a cool and dry season (from June to September) and a warm and wet season (from December to March).

2.2. Patients and data collection

Medical records were retrospectively screened to identify all patients hospitalized with confirmed NSTIs (International Classification of Diseases, 10th Revision) from January 1, 2008, to July 31, 2013. The following operative findings were used for definitive diagnosis: the presence of grayish necrotic fascia and/or adjacent subcutaneous soft tissues, lack of bleeding of those tissues during dissection, and the presence of foul smelling pus. The variables that were examined included age, sex, ethnic group, type and number of comorbidities, diagnosis at admission, time from admission to first operative debridement, portal of entry of infection, anatomical site of infection (central or peripheral), and type of symptoms at the time of admission.

Tissue samples obtained at the first surgical treatment were cultured and their results were recorded. Patient outcomes were also documented, which included number of operative debridements, need for amputation, the duration of hospitalization, time spent in intensive care unit (ICU), and the in-hospital mortality rate. Data from medical records were considered missing when they were not mentioned by the practitioner. The disease was classified into two types according to the culture results.¹ Type II NSTI included all cases caused by *Streptococcus pyogenes* either alone or in combination with other bacteria. All other cases were categorized as Type I.

2.3. Ethical considerations

The study was approved by the Institutional Review Board of Centre Hospitalier Territorial. Informed consents were not obtained from the patients, as this was a retrospective study. All data were anonymized.

2.4. Statistical analysis

Data were analyzed using STATA Statistical Software: Release 12 (StataCorp LP College Station, TX, USA). Median and range were used for quantitative variables that were not normally distributed, and mean and 95% confidence interval (CI) were used for normally distributed variables. Categorical variables were tabulated using frequencies and percentages. The Chi-square test was used for testing the significance of associations between categorical variables. Group differences were tested using the unpaired Student *t* test in cases of normal distribution and the nonparametric Mann–Whitney *U* test in cases of skewed distribution. Crude and adjusted relative risks (RRs) and 95% CI were calculated. Multiple logistic regression models were constructed to identify independent factors associated with mortality. Initial regression models were first constructed including all variables for which the *p* value (or the RR) was less than 0.05 and the RR was more than 1.1 or less than 0.90 in the univariate analysis. If two or more factors were highly correlated, only the most plausible one (from the literature) or the one with the fewest missing values was included in the model. To simplify the model, variables were removed one at a time depending on the significance test ($p < 0.05$) by the likelihood ratio test.

3. Results

Sixty-seven patients admitted for confirmed NSTI were included in the study over the period under review.

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