**ABSTRACT**

Background: The microbiology of SSSS within a children's hospital showing staphylococcal scalded skin syndrome (SSSS) is of interest to identify. We assessed the strain profile and isolate characteristics associated with SSSS in children at Texas Children's Hospital (TCH) from 2008-2015.

Methods: Patients and their isolates were identified from ongoing surveillance of SSSS at TCH. Patient chart and isolate searches were conducted for patients diagnosed with SSSS during the study period. Isolates were typed using Pulsed Field Gel Electrophoresis (PFGE) and sequence typing (ST) methods. Antimicrobial resistance (AMR) was determined through routine susceptibility testing. Molecular analysis included MLST, tst, etb, eta, pvl, agr, ν, and Staphylococcal cassette chromosome mec (SCCmec). Isolates from age-matched controls were included to determine differences in characteristics.

Results: Cases of SSSS in TCH increased from 5 in 2008 to 25 in 2015 (P<0.001). A majority of patients, often presenting with urticarial or scarlatiniform rash, were admitted as inpatients. Many patients were in hospital for more than 3 days. In total, 32 patients were included in this first study to detail the molecular characteristics of pediatric SSSS in the United States. All isolates were Staphylococcus aureus and 71% were methicillin-resistant. All isolates were identified from an ongoing surveillance study. Patient chart searches revealed 29 isolates were identified from an ongoing surveillance study. Isolates were identified from an ongoing surveillance study. Patient chart and isolate searches were conducted for patients diagnosed with SSSS during the study period. Isolates were typed using Pulsed Field Gel Electrophoresis (PFGE) and sequence typing (ST) methods. Antimicrobial resistance (AMR) was determined through routine susceptibility testing. Molecular analysis included MLST, tst, etb, eta, pvl, agr, ν, and Staphylococcal cassette chromosome mec (SCCmec). Isolates from age-matched controls were included to determine differences in characteristics.

Conclusions: Overall, 71% of the isolates were methicillin-resistant. All isolates were identified from an ongoing surveillance study. Patient chart searches revealed 29 isolates were identified from an ongoing surveillance study. Isolates were identified from an ongoing surveillance study. Patient chart and isolate searches were conducted for patients diagnosed with SSSS during the study period. Isolates were typed using Pulsed Field Gel Electrophoresis (PFGE) and sequence typing (ST) methods. Antimicrobial resistance (AMR) was determined through routine susceptibility testing. Molecular analysis included MLST, tst, etb, eta, pvl, agr, ν, and Staphylococcal cassette chromosome mec (SCCmec). Isolates from age-matched controls were included to determine differences in characteristics.

**OBJECTIVES**

To describe characteristics of SSSS within a pediatric population at Texas Children's Hospital (TCH) and compare the isolate characteristics in a control group matched by age and methicillin susceptibility.

**BACKGROUND**

Staphylococcal scalded skin syndrome (SSSS) is a generalized exfoliative skin infection that results in loss of superficial epidermis due to circulating exotoxins produced by S. aureus. Staphylococcal toxins and SSTIs are associated with the disease presentation. The current study is visualized in Figure 1.

**RESULTS**

The number of cases with SSSS has increased at TCH from 2008 to 2015. Twenty-three percent of patients were admitted as inpatients. Many patients were in hospital for more than 3 days. In total, 32 patients were included in the current study. No contemporary data exist with regards to the molecular epidemiology of 5. aureus strains causing SSSS in the United States.

**CONCLUSIONS**

The number of patients with a primary diagnosis of SSSS has increased at TCH from 2008 to 2015, most have been culture obtained or culture-negative cases.

In this first study to detail the molecular characteristics of pediatric SSSS in the United States, we found all isolates to be likely to contain USA300, lack virulence factors, and lack SCCmec. The current study findings are in agreement with contemporary studies outside of the US. Further characterization of ST121, which accounts for the genetic makeup and its role in other MSSA infections, is required to better understand its importance and the unique propensity of this strain to cause SSSS.

**METHODS**

**Staphylococcal scalded skin syndrome (SSSS)** is a generalized exfoliative skin infection that results in loss of superficial epidermis due to circulating exotoxins produced by S. aureus. Staphylococcal toxins and SSTIs are associated with the disease presentation. The current study is visualized in Figure 1.

**Figure 1. Epidermal Exfoliation: Exotoxin (ETA and ETB) Target**

**Table 1. Characteristics of SSSS cases and SSTI controls**

**Table 2. Association between MLST and detection of virulence genes**

**Figure 2. Patients with Ritter’s Disease (ICD-code 005.B1). 2008-2015**

**Figure 3. eBURST of SSSS isolates together with the S. aureus MLST database isolates**