

Increasing Incidence of Methicillin-Resistant *Staphylococcus aureus* in Greenland

Kjerulf A¹, Holt J¹, Jensen AB², Poulsen P², Petersen A³

¹National Center for Infection Control, Statens Serum Institut, Copenhagen, Denmark

²Dronning Ingrid's Hospital (DIH), Nuuk, Greenland

³National Reference Laboratory for Antimicrobial Resistance, Statens Serum Institut, Copenhagen, Denmark



Introduction

Greenland has a population of 55,860 inhabitants (January 2017) and Nuuk is the capital with around 16,000 inhabitants. Greenland has its own Ministry of Health and the country is divided into five health regions. There are five smaller hospitals, one national hospital in Nuuk (182 beds), and eleven health care centres in the five health regions. Patients with specific or serious diseases that cannot be treated in Greenland (e.g. haemodialysis, cancer treatment, brain surgery) are transferred to Denmark or Iceland for further treatment.

The health care system in Greenland signed a contract with National Center for Infection Control in 1998 concerning guidance on infection control and prevention. A hygiene committee has been established, health care workers have been educated as link personnel in hygiene, and guidelines for infection control and prevention have been made. A laboratory surveillance system of resistant microorganisms was established in 2000.

Objectives

The first case of methicillin-resistant *Staphylococcus aureus* (MRSA) in Greenland was diagnosed in 2000 and led to the first guideline on screening and treatment for MRSA. Up to 2015 there were only 14 patients with MRSA but since then a nearly 4-fold increase in incidence has been seen.

The objectives of this study were to analyze the reasons for this increase.

Methods

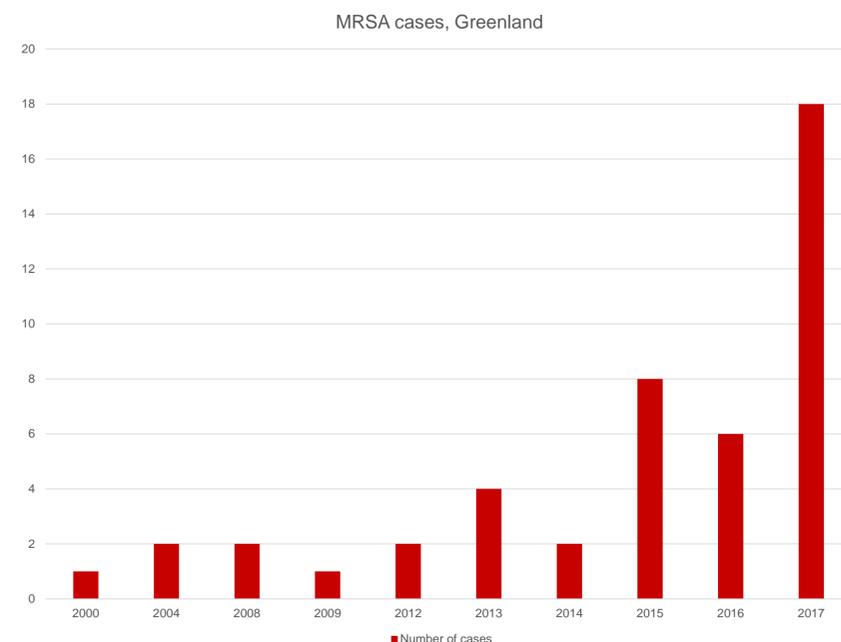
MRSA data were collected from the laboratory surveillance database at Dronning Ingrid's Hospital, typing results from the National Reference Laboratory for Antimicrobial Resistance at SSI, and the patient records.

Results

From 2000 to 2017, 46 patients (15 children and 31 adults) have been diagnosed with MRSA, see Figure 1.

- 28 patients were colonized with MRSA, predominantly in the nose and throat.
- 18 patients had infections: conjunctivitis, middle ear infections, wounds, skin abscesses, mastitis, surgical site infections etc.

Figure 1. Increasing incidence of MRSA in Greenland



The increase since 2015 was mainly due to three large outbreaks in three different cities: Aasiaat in 2014/2015 (seven persons with MRSA; three children and four adults), the capital Nuuk in 2016 (six persons with MRSA; two children and four adults) and Tasiilaq in 2017 (12 persons with MRSA; two children and ten adults).

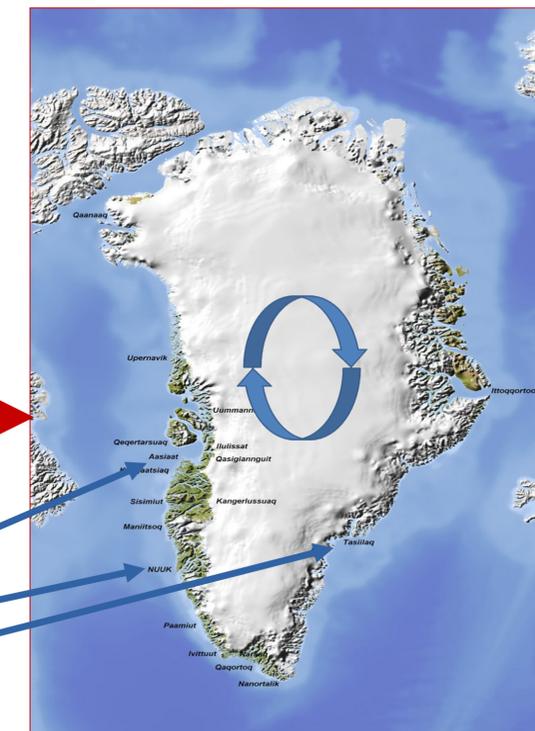
The outbreaks in Aasiaat and Nuuk were community-acquired with transmission in families and the last one in Tasiilaq was community-acquired or community-onset hospital acquired with transmission to health care workers and hospital staff in the hospital. Each outbreak was caused by a specific MRSA-type: t902 CC22 in Aasiaat (unknown epidemiology), t3979 CC5 in Nuuk (probably from Australia), and t304 CC6 in Tasiilaq (probably from Denmark).

Import Mainly from Denmark and abroad!



Outbreaks with transmission in Greenland

- Aasiaat in 2014/2015
- Nuuk in 2016
- Tasiilaq in 2017



Conclusions

- During the last few years there has been an increasing number of patients with MRSA in Greenland.
- The increase in incidence of MRSA can be explained by factors such as:
 - Import from Denmark or abroad due to admission to hospital or traveling
 - Transmission in Greenland is mainly seen:
 - In families with close contact
 - In hospital at wards with new-born or premature children due to close contact between the children and health care workers, and to close contact in families.

Preventive checklist

- An ongoing surveillance of MRSA and other resistant microorganisms
- Compliance to screening procedures
- Dedicated focus on patients admitted to hospitals abroad
- Compliance to guidelines for infection prevention and control
 - hand hygiene and use of gloves
 - use of aprons or gowns
 - isolation precautions
- A continuous focus on the use of broad-spectrum antimicrobial agents

