**ABSTRACT**

Mycobacterium marinum is an atypical mycobacterium and a rare cause of human skin infections. Typically, infections occur after skin trauma with exposure to fresh or salt water. While there are occasional case reports in the medical literature, there are no recent case series in the United States and no series which involve the Gulf Coast, a major center for the fishing and tourism industries. Review of the medical data base from our University Health-care system on the Gulf Coast revealed four culture-confirmed cases of M. marinum skin infections and an additional five cases of skin lesions which were not culture-confirmed but were clinically and histologically compatible with M. marinum infection. The four culture-confirmed cases all occurred in females, with an age range from 37 to 72 years. All four cases involved the distal right upper extremity. The additional five cases consisted of surgical biopsy specimens from patients with a clinical history of water-related trauma and a histologic picture of granulomatous inflammation compatible with M. marinum infection. These cases occurred in 2 females and 3 male patients. Of these cases, 3 involved the upper extremity while the remaining two involved the lower extremity. Of the 4 culture-confirmed cases and histologically compatible M. marinum infection, we found that 78% (7 of 9) of the cases occurred during the Spring and 67% (6 of 9) involved the distal right upper extremity. The majority of these cases occurred during the Spring months (56%), while none of the cases occurred during the Fall. We review the current literature and summarize the recent guidelines for treatment and management of these unusual water borne infections.

**INTRODUCTION**

Mycobacterium marinum is a well-established cause of skin and soft tissue infections. The organism is acquired through direct inoculation from an aquatic environment, either fresh or salt water. Prior exposure to a fish tank in a restaurant finding leading to the designation “fish tank granuloma”.

However, other sources such as pools and marine water are often reported.

Acutaneousorigin may not be necessary, as a case associated with abrasion from shaking oysters has been described. A recent French study, based on a national survey, listed at least 50 cases of cutaneous M. marinum, with an age range from 37 to 72 years. All four cases involved the distal right upper extremity. The additional five cases consisted of surgical biopsy specimens from patients with a clinical history of water-related trauma and a histologic picture of granulomatous inflammation compatible with M. marinum infection. These cases occurred in 2 females and 3 male patients. Of these cases, 3 involved the upper extremity while the remaining two involved the lower extremity. Of the 4 culture-confirmed cases and histologically compatible M. marinum infection, we found that 78% (7 of 9) of the cases occurred during the Spring and 67% (6 of 9) involved the distal right upper extremity. The majority of these cases occurred during the Spring months (56%), while none of the cases occurred during the Fall. We review the current literature and summarize the recent guidelines for treatment and management of these unusual water borne infections.

**RESULTS**

Clinical characteristics of the study group are listed in the Table. Overall, 78% (7 of 9) of the patients were male, and 78% of the cases involved the upper extremity. Interestingly, none exhibited a seasonal variation with 31% occurring in Winter, 50% in Spring, and 19% in Summer. Use of the information in logical thinking identified an clinically concealed cases was non-invasive granuloma formation. Ziehl-Neelsen staining was performed on all 5 biologically identified cases with no positive results. Penicillin G- and Ciprofloxacin (0.5%) methanamine Silver stains were both uniformly negative. A Fite stain was positive in 1 of 2 evaluated cases. Clinical presentations for the study cases included pain or inflammation unassociated with bleb or fluid, a history of trauma occurring either in an aquatic setting or prior to water exposure, and one case in which the patient reported fishing a fish tank.

**DISCUSSION**

The fact that most of the identified cases involved the upper extremity, with the remainder occurring on the lower extremities, is consistent with prior reports. In the best of our knowledge there have been no previous reports on seasonal variations. Use of the information in logical thinking identified an clinically concealed cases was non-invasive granuloma formation. Ziehl-Neelsen staining was performed on all 5 biologically identified cases with no positive results. Penicillin G- and Ciprofloxacin (0.5%) methanamine Silver stains were both uniformly negative. A Fite stain was positive in 1 of 2 evaluated cases. Clinical presentations for the study cases included pain or inflammation unassociated with bleb or fluid, a history of trauma occurring either in an aquatic setting or prior to water exposure, and one case in which the patient reported fishing a fish tank.

**METHODS**

We reviewed the available data base from our University Health-care system and identified 4 culture-confirmed cases and an additional 5 cases with histology and clinical history consistent with M. marinum infection of the skin in Mobile, Alabama, a Gulf Coast city with a metro population of approximately 400,000. The surgical pathology reports were reviewed on the cases with histology and when possible the corresponding hematoxylin and eosin-stained slides and special stains were evaluated. When available the medical records were reviewed for pertinent presenting information and past medical history.

**Figure 1**

Hematoxylin and eosin stain of non-invasive granuloma from a case with a clinical history of a abrasion on a barnacle in Mobile Bay.

**Figure 2**

Five stain demonstrating mycobacterial organisms