Necrotizing Fasciitis (Group A strep)

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Disease: Necrotizing fasciitis (flesh-eating disease): a disease caused by bacteria that attacks the fascia, fat, muscle and skin tissues; etiologic agent: group A Streptococcus, also called Streptococcus pyogenes; can also be caused by other bacteria including, but not limited to, Klebsiella, Clostridium, Escherichia coli, Staphylococcus aureus, and Aeromonas hydrophilia – this report will focus on group A strep as the etiologic agent because it is the most common bacteria that causes necrotizing fasciitis (1).

Transmission: Direct contact with droplets, mucus, or skin carrying group A strep and through the parenteral route. Most of the time, necrotizing fasciitis occurs in compromised patients with cuts, wounds, or breaks in the skin. (2) Most people who get necrotizing fasciitis have diabetes, cancer or some kind of chronic health problem that make them more susceptible to infection (1). A recent surgery can also pose a threat for necrotizing fasciitis.

Reservoir: Humans are the reservoir for group A strep. Group A strep is commonly found on skin, in throats of humans and other mucus membranes without any infection or illness present (2). It is typically harmless unless introduced to fascia, muscle, or the bloodstream, and occasionally causes other infections, such as pharyngitis, commonly known as strep throat.

General Characteristics of MO: S. pyogenes is gram-positive cocci that grow in chains. It forms a beta-hemolytic growth on blood agar. It is a facultative anaerobe, and non-motile.

Key tests for identification: Proper identification tests for S. pyogenes include a catalase test, which should be negative; the PYR test, which should be positive; and latex agglutination. (3)

Signs and symptoms of disease: fever, chills, fatigue, and vomiting; pain that is often considered disproportionate to what the wound or skin looks like, redness and swelling at a wound site, purple or red coloring that spreads quickly; ulcers, blisters or black spots on the skin (1)

Historical information: A Confederate army surgeon first described necrotizing fasciitis in 1871. The etiologic agent was first identified as bacteria in 1918 and it was named necrotizing fasciitis in 1952. Necrotizing means death of tissue and fasciitis comes from fascia, which is the tissue that connects muscles. Until the mid-1980s, cases of necrotizing fasciitis mainly occurred only in military hospitals. Worldwide, rates of necrotizing fasciitis increased in the mid-1980s. This increase is associated with increase in toxin-producing strains of S. pyogenes. (4)
Virulence factors: group A strep contains many virulence including the following - M-protein – adherence, prevent phagocytosis
Fibronectin-binding protein – adherence
Lipoteichoic acid – adherence
Hyaluronic acid capsule – immunological disguise, prevent phagocytosis
Streptokinase, streptodornase, hyaluronidas, streptolysins – all invasins
Exotoxins (5)

Control/treatment – Treatment for necrotizing fasciitis must be started immediately. Morbidity and mortality rates are high and likely for necrotizing fasciitis infections that are not treated early. Initial intervention and treatment is intravenous antibiotics. Because the exact etiologic agent may not be known, multiple antibiotics may be given to cover all bases. If the causative bacteria has already been identified, a clearer decision can be made on which antibiotic to use. Another necessary part of treatment is surgical intervention. Sometimes removal of infected tissue is enough, but often in extremities, amputation becomes necessary. (6)

Prevention/vaccine info, new trials: Most cases of necrotizing fasciitis are random and cannot be prevented (1). Persons with diabetes or other immunosuppressing conditions should often check extremities for cuts and wounds. Everyone, but especially those whose immune systems are compromised, should monitor cuts, scrapes, wounds, and injection sites. Proper hand washing and wound care are both preventative measures for necrotizing fasciitis and all types of infections. A person should seek immediate care if a wound ever appears infected, and especially if a fever is present. (2)

Local cases or outbreaks: The CDC reports that there are between 650 and 850 cases of necrotizing fasciitis caused by group A strep in the United States per year. (1) Outbreaks are not likely with necrotizing fasciitis because it is not a contagious or easily contracted disease. Necrotizing fasciitis does tend to be more prevalent in diabetics, alcoholics, intravenous drug users, and others with compromised immune systems (7). Healthy people can contract necrotizing fasciitis but it is uncommon. The rarity of necrotizing fasciitis often brings about media attention when a case does arise. A simple search for “flesh-eating bacteria” brings about many articles and videos by ABC and other media outlets.

Global cases or outbreaks: The UK reports incidence of about 500 new cases of necrotizing fasciitis each year, Canada estimates 90-200 cases per year, and Australia reports 3.8 cases per 100,000 people per year. (7)

Through research, it seems that there is not a lot of incidence reporting for necrotizing fasciitis, and any resources that do have incidence also indicate that necrotizing fasciitis often goes unreported.
References

(1) "Necrotizing Fasciitis: A Rare Disease, Especially for the Healthy." *Centers for Disease Control and Prevention*. Centers for Disease Control and Prevention, 17 Apr. 2015. Web. 09 May 2016.

http://www.cdc.gov/features/necrotizingfasciitis/


http://www.cdc.gov/groupastrep/about/faqs.html


http://textbookofbacteriology.net/streptococcus.html


http://www.medicinenet.com/necrotizing_fasciitis/page5.htm#what_is_the_treatment_for_necrotizing_fasciitis


http://ceaccp.oxfordjournals.org/content/early/2012/06/27/bjaceaccp.mks033#