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Assignment title -Component 2 - Major Public
Health

Intro

The Scarlet Fever

Outbreaks of scarlet fever are still possible, despite the disease's rarity. Conditions that encourage close human interaction are optimal for transmission (eg, in schools or daycare centers).

Scarlet fever is an illness that mainly affects children and is caused by a streptococcal infection, most typically in the pharynx but occasionally elsewhere (eg, the skin). The erythrogenic toxin produced by group A streptococcal strain is responsible for the pinkish-red, pressure-sensitive cutaneous flush characteristic of scarlet fever. Some persons with strep throat develop scarlet fever, a bacterial infection. Scarlet fever, often called scarlatina, is characterized by a brilliant red rash that spreads over the entire body. Scarlet fever is characterized by a high temperature and a sore throat. *Streptococcus pyogenes*, sometimes called group A streptococcus, is a type of bacteria commonly found on the skin and in the throat, and it is responsible for causing this disease. Prior to the widespread use of antibiotics in the 1940s, scarlet fever was among the worst infectious diseases. *Streptococcus pyogenes* (group A *Streptococcus*, GAS) is a Gram-positive bacterium that can also cause suppurative pharyngitis and tonsillitis, impetigo and erysipelas, cellulitis, toxic shock, necrotizing fasciitis, in addition to scarlet fever. Rheumatic fever, rheumatic heart disease, and acute post-streptococcal glomerulonephritis are all autoimmune disorders brought on by recurrent infection (Walker et al., 2014)

Although there have been fewer cases of scarlet fever in recent years, several large outbreaks have occurred in recent decades.

For instance, Public Health England reports 2,830 occurrences of scarlet fever between September 2013 and March 2014. There were 5,746 cases within the same time frame in 2014/2015. The current uptick is mysterious.

In the winter and early spring, scarlet fever is common. Rash, sore throat, red cheeks, and tongue swelling are some of the signs.

Main body

Scarlet fever was one of the first diseases for which there was an active policy to prevent it, and some people in the late 1800s saw this as a great victory for preventive medicine. At the middle of the 20th century, it killed about 10,000 people each year in England and Wales. Most of the people who got it were children between the ages of one and five. Adults did get it, but babies didn't get it very often. In the 1860s, it was called "the most feared, yet least feared, of all familiar diseases." It was thought to be more contagious and deadly than any other disease. It was common in all social groups and often killed people. Early efforts by London's medical officers to clean and isolate cases didn't help much, but when the Metropolitan Asylums Board opened isolation hospitals in the 1870s, death rates dropped, and this was more noticeable in London than in other places.

Scarlet fever mostly affects kids between the ages of 2 and 8, but anyone can get it. Scarlet fever can sometimes spread through nurseries and schools. Most people get the disease in the winter and spring.

Scarlet fever symptoms only show up in people who are sensitive to the toxins made by the streptococcus bacteria. Most people will have built up a defense against these toxins by the time they are 10 years old.

Scarlet fever is rare, but it is possible to get it more than once. Streptococcal sore throats and other infections caused by the same bacterium can still happen to people who are immune to the toxins that cause rashes.

In the past, scarlet fever was more common and could be worse. Now, severe cases of scarlet fever are rare, and antibiotics can be used to treat it.

Most cases of scarlet fever don't lead to any problems, especially if the illness is treated right away. In the early stages of the disease, however, complications like ear infections, throat abscesses, sinusitis, pneumonia, and meningitis can happen.

Some very rare complications include rheumatic fever, kidney damage, liver damage, bone infection, blood poisoning, and toxic shock syndrome, which can be fatal.

The UK Nationwide Notifiable Infectious Diseases Reporting Information System was used to get the scarlet fever case data that was used in this study (established in 2003). The National Bureau of Statistics of UK (<http://data.stats.gov.cn>, accessed on December 20, 2022) provided information about the population. This surveillance system was used to find out how often scarlet fever happened in different age groups in mainland UK between 2003 and 2016. The incidence rates of scarlet fever by age (0–14, 15–64, and 65+) for each year were compared to the most recent population data from 2015 to do direct age standardization. The exact method was used to figure out the 95% confidence intervals. By dividing the age-standardised median incidence rates, age-adjusted risk ratios (RR) and 95% confidence intervals (CI) were found to compare how often scarlet fever happened between 2011 and 2016 and between 2003 and 2010. For our analysis of the spread of scarlet fever, we focus on data from after 2011. From 2011 to 2016, data on geographic incidence was taken. After comparing the 2016 data with the data from 2011 to 2015, it was found that the 2016 data was representative of the six outbreak years. We got all the information we could find about how often scarlet fever happens in UK. After 1949, when the new People's Republic of the UK was formed, this information came out in 1950. The Health Statistics Yearbook of the National Health and Family Planning Commission (<http://www.nhfpc.gov.cn/zwgkzt/tjnj/list.shtml>) is where we got the data on the number of cases from 1950 to 2002. We used Excel and Stata 14.0 to look at the spatial, temporal, and population distribution data above. This manuscript was written following the rules set by RECORD

From 2004 to 2011, a national molecular epidemiologic study was done to find out about the emm types, virulence factors, and antimicrobial resistance of strains that were going around in both the north of UK, where scarlet fever was common and the south, where it was not. Samples of throat swabs were taken from people who had been diagnosed with scarlet fever or pharyngitis. Patients with scarlet fever had a fever of over 38 degrees Celsius, a sore throat, a "sandpaper-like" rash on their trunk and limbs, and a "strawberry-like" tongue. Parents in

England are being told by the country's health agency to be aware of the signs and symptoms of scarlet fever as the number of cases keeps rising across the country.

More than 15,370 cases of the old killer were reported to Public Health England between mid-September and the week ending March 18. Nick Phin, deputy director at Public Health England, said that this rise might be due to more people knowing about it and better ways of reporting it. Scarlet fever is a very contagious disease that is marked by a rash that looks and feels like sandpaper. It is caused by the same bacteria that cause strep throat, called group A *Streptococcus pyogenes*.

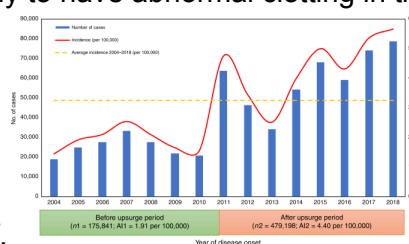
Scarlet fever is known by its red cheeks and rash.

As the number of cases of scarlet fever goes up, researchers look into it.

Parents are being told by Public Health England to keep an eye out for these signs because, if caught early, the illness is mild and can be treated with antibiotics. Early treatment can also lower the risk of complications like pneumonia and stop the infection from spreading.

"We are keeping a close eye on the situation," Phin said in a statement. "Parents should be aware of the signs of scarlet fever and call their family doctor if they think their child might have it." Professor Helen Stokes-Lampard, Chair of the Royal College of General Practitioners in the UK, said, "It is a very contagious disease, and children under 10 are much more likely to get it than teenagers or adults." "Scarlet fever used to be a lot more common than it is now, but doctors are seeing more cases than in previous years right now."

The patient had signs of plague, such as gangrene in the right hand, which caused the fingers to die. In this case, the presence of plague bacteria *Y. pestis*, which spread throughout the body (septicemia), made this patient more likely to have abnormal clotting in the blood vessels of



fingers, which caused the skin to peel off.

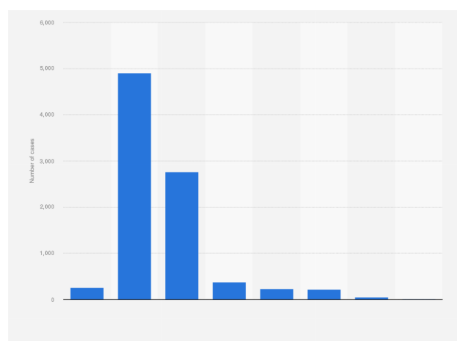
In the last few years, the number of cases in England has gone up. In 2014, the number of cases tripled from the seasonal average of 4,700 in 2013 to 15,637.

Scarlet fever is an infectious disease that needs to be reported in England. It is usually diagnosed based on symptoms and signs, with or without confirmation of GAS expressing erythrogenic toxins. The triad of fever, sore throat, and the rash are common, but not very specific. If the rash comes after the other symptoms, it could be mistaken for mild pharyngitis or tonsillitis. 11 Clinicians have a hard time telling the difference between viral upper respiratory tract infections, which should not be treated with antibiotics, and scarlet fever and other severe symptoms of GAS infection, which should be treated right away with antibiotics. Scarlet fever affects not only the person who has it, but also their family and the rest of the community. To stop the disease from spreading, people who have it are kept out of school or nursery until they have been on antibiotics for 24 hours. This has an educational cost for the person who has it and an economic cost for parents or guardians who care for children. GAS is easily spread, so

everyone in the house has a higher chance of getting sick. Getting a better understanding of the disease means getting a better understanding of these other effects as well.

The number of infections kept going up, reaching nearly 20,000 in 2016. This was the most infections in the UK in the last 50 years.

The health agency is also telling family doctors, pediatricians, and other health professionals that they need to know about the infection when they are checking on patients.

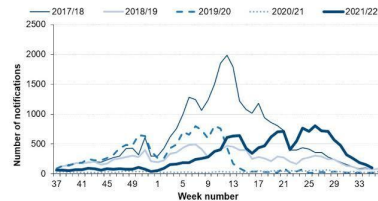


Theresa Lamagni, a senior epidemiologist at Public Health England, told CNN in a previous report, "Guidance on how to handle outbreaks in schools and nurseries has just been updated, and research is still going on to find out more about the rise." "We advise parents to know what scarlet fever looks like and to call their doctor if they think their child might have it."

Compared to existing books and guidelines Classical descriptions of the disease from the beginning of the 20th century and information in current UK public health and clinical guidance back up what respondents said about the symptoms of scarlet fever. 4 12 15 16 The best way to treat scarlet fever is for doctors and parents to be able to tell it apart from more common and less serious infections. Current UK clinical guidance for sore throat says that antibiotics should only be given if a more serious condition is suspected, like a suppurative infection or sepsis. 17 Rapid appraisal for GAS pharyngitis has shown that the Fever-PAIN and Center scores work, but they don't work for scarlet fever. 18 19 When the rash of scarlet fever shows up and is recognized, doctors should start antibiotics, especially in the spring when the number of cases usually goes up (from March to May in the UK). 20 The fact that household contacts of people with scarlet fever are 12 times more likely to get invasive GAS shows how important a quick diagnosis and treatment are for public health. 10 The advice that most sore throats don't need antibiotics is good for antimicrobial stewardship. However, scarlet fever and other GAS infections do need antibiotics to prevent complications and spread.

Conclusion

Strep throat and skin/soft tissue infections like impetigo and cellulitis are the most common GAS symptoms. Acute rheumatic fever and post-streptococcal glomerulonephritis are rare GAS complications (heart and kidney diseases caused by an immune reaction to the bacteria).



However, GAS can induce more serious invasive infections (iGAS infections) such as bacteremia, necrotizing fasciitis, and streptococcal toxic shock syndrome (rapidly progressive symptoms with low blood pressure and multi-organ failure). Injection drug usage, alcoholism, immunosuppression, and cancer are risk factors for iGAS infections. Invasive GAS infections are rare, yet 15–25% of patients die. Public Health UK monitors infectious illness rates. Scarlet fever's characteristic rash may be delayed or mild, making it difficult to distinguish from viral infections. Both disorders cause sore throats. COVID-19, a new cause of acute febrile illness, underscores the difficulty of updating diagnostic algorithms and recommendations.³³ Clinical objectives include ruling out measles (links to known cases and immunization history are crucial)¹⁴ and prescribing antibiotics. Until diagnostic techniques improve in sensitivity, speed, and cost-effectiveness, scarlet fever is diagnosed by clinical evaluation of symptoms and signs in the context of epidemiological patterns, followed by microbiological confirmation. The local occurrence should encourage physicians and caretakers to discuss symptoms of concern, such as a sand-papery rash, so new symptoms can be investigated. To prevent outbreaks, population-level research on scarlet fever and invasive GAS will guide diagnosis, treatment, and public health efforts. '

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