

Communicable Diseases

WATCH



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Cluster of invasive Group B Streptococcus ST283 cases related to freshwater fish 2021

Reported by Communicable Disease Branch, CHP.

Background of Invasive Group B Streptococcus infection and ST283

Group B Streptococcus (GBS), *Streptococcus agalactiae*, is an encapsulated gram-positive non-motile coccus bacterium. It is widely distributed among diverse species including humans, mammalian animals, amphibians, reptiles and fishes. GBS is found in 20% to 40% of healthy adults and colonises in human gastrointestinal and genitourinary tract as commensals¹. Since the 1960s, GBS has been increasingly recognised as a common pathogen of severe invasive diseases among vulnerable populations. It is the leading cause of neonatal meningitis and sepsis, which is acquired vertically through contact with mucous membranes or infected amniotic fluids^{2,3}. It is also a significant cause of severe infections among vulnerable adults including sepsis, septic arthritis, meningitis and infective endocarditis, but the source of these infections largely remained unknown.



Figure 1 - An image of freshwater fish swab taken during field investigation performed by CHP at local wet market.

GBS has ten capsular types, of which Sequence Type 283 (ST283) belongs to serotype III-4. In recent years, it was found that ST283 was among the more virulent strains of GBS and caused invasive diseases in many otherwise healthy adults or adults with relatively few underlying comorbidities. Presence of GBS ST283 was reported in freshwater fish (Figure 1), in particular farmed fish, in Southeast Asian countries with prevalence reported to be ranging from 12.5% to 100%⁴. In 2015, GBS ST283 caused a major invasive foodborne outbreak involving at least 146 people in Singapore⁵. Epidemiological investigations showed that the outbreak had a strong link with the consumption of raw freshwater fish including raw “Asian bighead carp” and “snakehead” and this has led to a ban in the use of raw freshwater fish in all ready-to-eat raw fish dishes in Singapore since December 2015. Thereafter, invasive GBS ST283 disease has also been reported in other countries and areas in and around Southeast Asia including China, Hong Kong SAR, Lao People’s Democratic Republic, Thailand, and Vietnam. In Hong Kong, the sale of “freshwater fish sashimi” is prohibited under Cap 132X.

Recent upsurge of invasive Group B Streptococcus infection

From January 2019 to August 2021, according to the data from Hospital Authority (HA), the number of blood specimens cultured positive for GBS ranged from 9 to 26 cases per month, mainly affecting neonates and vulnerable groups. On September 30, 2021, HA has alerted The Centre for Health Protection (CHP) of the Department of Health of an upsurge of invasive GBS cases in public hospitals since Sep 2021 and an investigation was commenced by CHP to study if there is any reason for the upsurge. As of October 10, 2021, a total of 79 cases of GBS bacteraemia have been detected in HA since September 2021 (58 cases in September and 21 cases in October).

Preliminary epidemiological investigations showed that some of the patients have history of handling freshwater fish, including grass carp, before onset of symptoms. Some of them had reported handling of raw freshwater fish with hand wounds. CHP has collected some fish and environmental samples taken in markets visited by some of the cases in early October for GBS screening.

CHP has requested HA to send bacterial isolates to Public Health Laboratory Services Branch of CHP for whole genetic sequencing. Genetic analysis revealed that 32 human cases belonged to a particular strain of serotype III ST283 which was of almost identical genetic sequencing to 5 fish/environmental samples taken in markets visited by some of the cases, while 27 cases belonged to other serotypes or a different strain of ST283 and genetic analysis were pending for the other 20 cases.

The 32 ST283 with the same sequence involved 14 males and 18 females with ages ranging from 31 years to 87 years (median: 65 years). All were adult cases.

The cases resided in various districts with no obvious clustering in any specific districts. Preliminary investigation did not reveal any direct epidemiological linkage between the cases and there was no family cluster. Twenty-eight cases with known onset date had onset of illness between September 8, 2021 and October 7, 2021. The cases mainly presented with sepsis/septicaemia followed by pyogenic arthritis, meningitis and abscess and/or cellulitis. According to the information from HA, 2 out of 32 cases were known to have died and 10 have been discharged from public hospitals.

About half (16 out of 32, 50.0%) cases reported a history of handling raw fish and none of them reported consuming raw/undercooked freshwater fish. Among the 16 cases who handled raw fish, two cases were chefs working in two food premises in different districts and one was a part-time fish seller. The common types of freshwater fishes handled, as recalled by patients, included 鯪魚, 大魚 and 烏頭. Twenty-two out of 32 cases reported frequent visits to fish stalls from wet markets/supermarkets in various districts without obvious clustering.

Combining the epidemiological, environmental and laboratory investigation so far, the recent upsurge was probably due to an outbreak of GBS cases caused by a strain of GBS ST283. Based on available information, the CHP considers that handling raw freshwater fish, particularly those with hand wounds may be associated with the infection and the risk of associated with consumption of undercooked freshwater fish cannot be excluded at this stage.

According to reported studies, ST283 is commonly found in freshwater fish in Southeast Asian countries such as Malaysia, Vietnam and Thailand. In view of positive finding of ST283 in local fish, further surveillance of ST283 in freshwater fish in Hong Kong will be carried out. The exact cause of the outbreak is still under investigation at this moment.

CHP will continue to closely monitor invasive GBS cases reported by HA to identify risk factors and epidemiological linkage. Press releases were issued on October 4, 2021 and October 18, 2021 to alert the general public and a letter to doctors has also been issued to medical practitioners on October 18, 2021. CHP has liaised with relevant government departments to carry out thorough disinfection in the markets concerned and further investigate the source of ST283 in fish.

To prevent invasive Group B Streptococcus infection associated with freshwater fish, members of the public are reminded to maintain personal, food and environmental hygiene and should keep their hands clean and practice good wound care at all times, especially:

- ◆ Wear gloves while handling raw freshwater fish or seafood and avoid having wounds coming in contact with raw freshwater fish or seafood;
- ◆ Avoid eating raw freshwater fish or freshwater aquatic products; and
- ◆ Avoid skin contact with dirty water when visiting a wet market and maintain good hand hygiene.

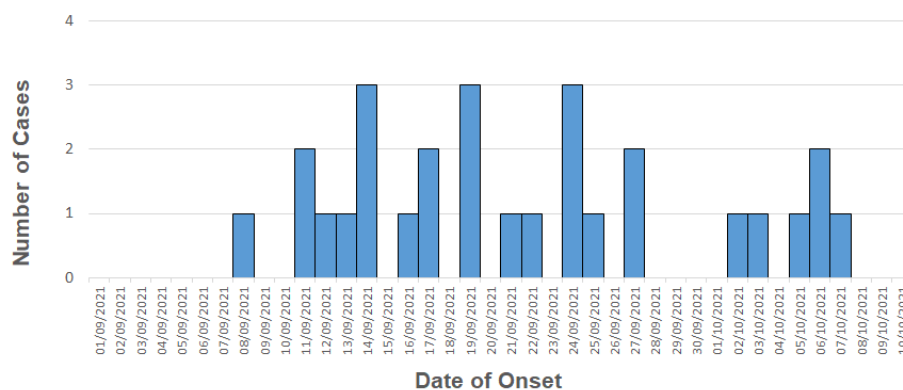


Figure 2 - Epidemic curve by date of onset (N=28 cases with known onset date)

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