Epidemiological Alert:

Haemolytic Uraemic Syndrome (HUS) and infection by Enterohaemorrhagic *E. coli* (EHEC)

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The objective of this alert is to provide an update on cases of Haemolityc uraemic syndrome (HUS) and on cases of infection by enterohaemorrhagic *E. coli* (EHEC) (or Shigatoxin-producing *E. coli* (STEC)) in Europe and countries of our Region. Also included are the Pan American Health Organization (PAHO) recommendations to Member States related to this theme.

Current Situation

On 22 May, Germany reported a significant increase in the number of patients with haemolytic uremic syndrome (HUS) and bloody diarrhoea caused by Shiga toxin-producing *E. coli* (STEC). Since 2 May 2011 and up to 7 June 2011, a total of 661 cases of HUS and 1,672 cases of non-HUS STEC have been reported from European Union Member States; this includes 630 HUS cases and 1,601 non-HUS STEC cases in Germany alone. The majority of cases are adults and more than two thirds of them are women. Sixteen of the HUS cases and six of the STEC cases have resulted in deaths.

Laboratory results indicate that STEC serogroup O104:H4[1] is the causative agent.

The source of the outbreak is under investigation, but contaminated food seems to be the most likely vehicle of infection.

Most cases are from, or have a history of travel to the North of Germany. Within the EU cases have been reported from Austria, Denmark, Spain, Finland, France, Norway, the Netherlands, Poland, Sweden, United Kingdom and the Czech Republic.

Case Definition

Developed by the Robert Koch Institute to be applied to HUS-cases associated with the 2011 Germany outbreak.

HUS Clinical criteria:

A clinical picture of acute enteropathogenic HUS is defined by the presence of at least two of the following three criteria:

1. Hemolytic anemia
2. Thrombocytopenia ≤ 150,000 cells/mm3,
3. Renal dysfunction

Laboratory confirmed cases:

Positive result in at least one of the following tests:

Detection of Shigatoxin

1. Culture of the pathogen and isolation only from stool **AND** detection of Shigatoxin Stx2 using ELISA on the E. coli culture,
2. Mixed culture of the pathogen, enriched stool cultures or isolation of E. coli **AND** nucleic acid amplification test (e.g. PCR) for detection of the shigatoxin gene stx2 from the same sample

Indirect (serological) detection

1. Detection of ant-LPS-IgM-antibodies against E.coli Serogroups (once markedly increased titre/concentration, e.g., using ELISA, Western Blot)
2. Marked change between two consecutive samples in titreconcentrarion of anti-LPS-IgG-antibodies against E.coli serogroups e.g.; using ELISA)

Suspect HUS case:

Case with a clinical picture of acute enteropahogenic HUS as assessed by the attending physician, but not formally meeting the clinical criteria (at least two of three) identified above, are classified as suspect cases regardless of laboratory confirmation.

[1] Stx2-positve, *eae*-negative, *hly*-negative, ESBL, **aat, aggR, aap**. PFGE results show an indistinguishable pattern of 7 human O104:H4 outbreak strains in Germany and 2 strains of O104:H4 in Denmark.

In the Americas Region

The United States Center for Disease Control and Prevention (CDC) reported that as of 7 June 2011, in the US there has been one confirmed case and three suspected cases of STEC O104: H4 in persons with recent prior travel to Hamburg, Germany, where they were probably infected. Two of the three suspected cases are HUS.

Likewise, the Canada Public Health Agency reported on 7 June 2011 that a suspected case of STEC O104 was detected in a resident of Canada with recent prior travel to the north of Germany.[2]

Recommendations

The World Health Organization is not making any new recommendations for the treatment of cases related to this outbreak in particular.[3]

Normal hygiene measures should be observed. Hand washing after toilet use and before touching food, are highly recommended, as the bacterium can be passed from person to person, as well as through food, water and direct contact with animals. The bacteria is destroyed by thorough cooking of foods until all parts reach a temperature of 70 °C or higher.

Anyone who has developed bloody diarrhoea and abdominal pain and who has recently had contact with northern Germany should seek medical advice urgently. HUS complications can cause acute kidney failure and which may develop after the diarrhoea has resolved.

Travel and international trade

The World Health Organization does not recommend any restrictions in travel to or trade related to this outbreak.

Technical information

Daily updates respecting the number of Haemolytic uraemic syndrome (HUS) cases are published on the following websites:

- **WHO Europe**: http://www.euro.who.int/en/what-we-do/health-topics/emergencies/international-health-regulations/news/news/2011/06/ehec-outbreak-update-10
- **WHO**: http://www.who.int/csr/don/en/index.html
- **CDC**: http://www.cdc.gov/

Laboratory Protocols

WHO Global Salm Surv. Manual of Diagnostic Procedures and characteristics of Escherichia coli O157 producer of the Shigatoxin based on clinical specimens starting in 2007. The guide is available in Spanish via the following link: http://fos.panalimentos.org/gfn/ManualesdeProcedimiento/tabid/783/language/es-ES/Default.aspx

The standard laboratory protocols for molecular subtyping of the pathogens under surveillance by PulseNet laboratories. Available via the following link: http://www.pulsenetinternational.org/SiteCollectionDocuments/pfge/5%201_5%202_5%204_PNetStand_Ecoli_with_Sflexneri.pdf

[2] Canada currently uses the following definition to identify suspect cases of STEC O104 associated with Germany outbreak: Temporary stay in Germany any time in the 10 days prior to illness onset; AND Symptom onset on or after May 1, 2011 AND: Either: - Clinical diagnosis of hemolytic uremic syndrome (HUS) OR - Laboratory detection of Shiga-toxin 2 (Stx2) in stool.

[3] http://www.euro.who.int/en/what-we-do/health-topics/emergencies/international-health-regulations/news2/news/2011/06/ehec-outbreak-rare-strain-of-e.-coli-unknown-in-previous-outbreaks