STEC O104:H4 outbreak, activities at EU level

Johanna Takkinen
Head of Food- and Waterborne Diseases and Zoonoses programme
Office of the Chief Scientist
European Centre for Disease Prevention and Control
EU RL for E. coli, Rome, 4 November 2011
Detection of the outbreak in Germany

• 19.5; a call from Hamburg to Robert Koch Institut
  – A cluster of three HUS cases among children

• 20.5; RKI team travelled to Hamburg
  – First in depth interviews: also adult HUS cases
  – Case numbers were rising

=> Outbreak investigation initiated immediately
Case-control studies in Germany

Case-control studies

• **Two case-control studies in Hamburg**
  - Salads, cucumbers and tomatoes most likely vehicle of infection
  - Results communicated on 25 May; joint press release RKI-BfR

• **Canteen study in Frankfurt**
  - Cases were more likely to have bought salad in the canteen
  - Multivariate OR 6.57 (95% CI 1.37 – 31.39)

• **Matched case-control study in Lübeck, Bremerhaven and Bremen**
  - Matched by age, gender and place of residence
  - Matched OR for having eaten sprouts 4.35 (95% CI 1.05 – 18.0)

Cohort studies in disease clusters

Over 30 cohorts investigated since June 1, 2011 to identify the vehicle of infection and further cases, e.g.

- Cohort studies of **travel groups** (in cooperation with foreign authorities)
- Cluster analysis of different **restaurant-associated outbreaks**
- Analysis of **billing data of guests** at an affected canteen; results published on June 3, 2011 (press release RKI-BfR)
- „**Recipe-based restaurant cohort study**“
  - Relative risk for sprouts 14.2 (95% CI 2.40 – infinite)

*Source: Robert Koch Institute, 20.6.2011*
Size of the outbreak in Germany

3842 cases

- 2987 non-HUS STEC
- 855 HUS
- 18 deaths (0.6%)
- 35 deaths (4.1%)

Incubation period:
- Median 8 days (25% 6 d, 75% 10 d)

Time between diarrhoea and HUS:
- Median 5 days (25% 4d, 75% 7 d)

Of HUS cases
- 68% women
- Median age 42 years (0-91 years)
- Bloody diarrhoea in 79%
Epicurve of the STEC O104:H4 outbreak, Germany 2011

Incidence of HUS during the STEC O104:H4 outbreak by county, Germany 2011

(German cases /100,000 population*)

*cases known to be associated with intra-German travel are counted in the county of infection

Epidemiologic investigations in the course of the outbreak

- RKI invited by Hamburg PH authorities
- Press release consumer advice on sprouts

**Epidemiologic investigations in the course of the outbreak**

- **cohort studies**
- **case-control studies**

**Date of onset of diarrhoea**

- **EHEC** N=2717
- **HUS** N=809

- Lower Saxony’s MoAgriculture announces that sprouts are vehicle of infection

- RKI invited by Hamburg PH authorities
- Press release consumer advice on sprouts

**Number of cases**

- 0
- 5
- 10
- 15
- 20
- 25
Notification to ECDC by Germany

EWRS on 22 May

NAME: Germany

INSTITUTION: Robert Koch-Institute

EVENT INFORMATION:

POSTED ON: 22/05/2011
MESSAGE CONTENT: Other information
REPORTING MEMBER: Germany
REPORTING REASON: 43 have epidemiologically-linked cases of the same disease been detected/reported recently
SYNDROME / DISEASE: HUS
PATHOGEN: Germany
COUNTRY OF OCCURRENCE: Germany
DATE OF ONSET / DETECTION: 18/05/2011
MAIL SENT TO: European Commission, Public Health Authorities and ECDC
ACCESSIBILITY: This message is accessible to WHO

MESSAGE:

(Title: Germany, there has been an increase in the number of patients presenting with Haemolytic Uraemic Syndrome (HUS) with more than 30 possible cases reported since the second week of May. New cases continue to occur, particularly in the Federal States of Germany, but cases have been reported in other countries, including the United Kingdom and Germany. A causal relationship cannot be established at this time.)

Urgent inquiry on 24 May

EPIS Epidemic Intelligence Information System

Urgent Inquiries: HUSSTECE outbreak among adults in Germany

REPORT

DATE: 02/06/2011
COUNTRY: Germany
INFECTION: None
CASES: 80

Epidemiological Information

UPDATE 25.5.2011: A team of physicians and public health experts from the Robert Koch-Institute and the Federal Ministry of Health is currently investigating the outbreak. The cases are characterized by severe kidney failure in children and adults. The causative agent is still unknown. The team is working on a preliminary report on the outbreak. Further information can be found at http://www.zentralblatt-math.org/inspenglish/index.php.

SUSPECTED SOURCES

UPDATE 25.5.2011: A team of physicians and public health experts from the Robert Koch-Institute and the Federal Ministry of Health is currently investigating the outbreak. The cases are characterized by severe kidney failure in children and adults. The causative agent is still unknown. The team is working on a preliminary report on the outbreak. Further information can be found at http://www.zentralblatt-math.org/inspenglish/index.php.

Additional information and updates are available on the ECDC website.
First questions:

- How common is serotype STEC O104:H4 in humans?
- How common is serotype STEC O104:H4 in animals/food?

**TESSy human data from 2009:**
- No cases of STEC O104:H4 reported

**Scheutz/ Enter-net data:**
- Two cases in Germany in 2001
- One case in France in 2004

**ECDC-EFSA joint report 9 June:**
- One case in Finnish traveller in 2010 (Egypt)
- No animal/food isolates reported
- Literature; one case in Korea in 2005

**Additional info from CDC, US:**
- Strains isolated from two patients during an unconfirmed outbreak of HUS in the Republic of Georgia in 2009
EFSA/ ECDC joint public health advice on preventive food safety measures

First version on 3 June
- update on 11 June 2011

Prevention measures

Public health advice on prevention of diarrhoeal illness with special focus on Shiga toxin-producing Escherichia coli (STEC), also called verotoxin-producing E. coli (VTEC) or enterohaemorrhagic E. coli (EHEC)

UPDATED joint statement by the European Centre for Disease Prevention and Control (ECDC) and the European Food Safety Authority (EFSA), 3 June 2011

On 22 May 2011, 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, over 400 HUS cases and over 1000 STEC cases have been reported in Germany. Additional HUS and STEC cases linked to the outbreak have been reported in several other EU/EEA countries; Austria, Czech Republic, Denmark, France, the Netherlands, Norway, Poland, Spain, Sweden, and United Kingdom. While HUS cases are usually observed in children under 5 years of age, over 80% are adults in this outbreak, with a clear predominance of women (about 68%).
Public health laboratory support

National reference laboratory survey on 2 June

- 83% (25/30) laboratories replied
- 48% countries: no detection of non-O157 available in any clinical laboratory
- 56% of laboratories capable of diagnosing outbreak strain

=> 19 laboratories willing to receive diagnostic support:
  - A set of control strains (from WHO-CC)
  - Antisera K9 and O104
Rapid risk assessments (RRAs) and epidemiological updates

25 May - By request from DG SANCO following EWRS on 22 May

26 May - Daily summaries of epidemiological situation

27 May - Update with more info from RKI and isolation of STEC in cucumbers

14 June - Update, seven other countries had reported cases, sprouts confirmed

24 June - EWRS from FR: cluster of HUS in Bordeaux, sprouts suspected

29 June - First joint EFSA/ECDC RRA: EFSA task force on food trace-back investigations

8 July - Update on ECDC/EFSA RRA: overall EU assessment
  • Asymptomatic carriers among persons in one German cluster: 18/30 positive
  • No significant person-to-person transmission
  • Outbreak ceasing

26 July - Last epidemiological update
Support to clinicians

Teleconference among clinicians coordinated by ECDC on 9 June

Podcast of Dr. Jan Kielstein

Severe renal and neurological complications, seizures and coma
EU mission to Germany to assist in investigation

- ECDC sent liaison officer to RKI

- EU delegation of EFSA, ECDC and the Commission to Germany in early June

- EFSA assisted federal food authorities in Germany with trace back investigation 5-16 June
EFSA Task Force report on 5 July 2011

TECHNICAL REPORT OF EFSA

Tracing seeds, in particular fenugreek (Trigonella foenum-graecum) seeds, in relation to the shiga toxin-producing E. coli (STEC) O104:H4 2011 Outbreaks in Germany and France

European Food Safety Authority

Key words
Shiga toxin-producing E. coli (STEC), VTDC, ZLEC, AHEC, sources, traceback, trace-forward.

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Cases in other countries

• In 15 countries mainly travel related cases detected
• Totally 83 STEC cases and 54 HUS cases
  – 2 deaths among HUS
• 75 cases in the EU
  – 35 in Sweden
  – 16 in Denmark

Photo: Texas AgriLife Research
Lessons learned

• Risk assessment and risk management authorities need intensive and close collaboration throughout an outbreak

• Collaboration at EU level worked well but can be further improved

• Joined training at EU level on investigations of foodborne outbreaks would enhance the preparedness for future events

• Risk communication is challenging and requires good coordination both at national and international level
THANK YOU!

Photo 'sprouting fenugreek' reproduced under creative commons license: Flickr.com and DeathByBokeh