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Surveillance of Haemolytic Uraemic Syndrome in Children Under the Age of Sixteen in the United Kingdom and Republic of Ireland

Abstract

Haemolytic Uraemic Syndrome (HUS) is a rare, but occasionally fatal, condition that can develop after a gastrointestinal infection by a Verotoxin-producing strain of *Escherichia coli* (VTEC). We do not know why some children with VTEC infection develop HUS and others don't. This study will measure the incidence of HUS in the UK and Ireland in children under 16, and describe clinical and demographic features. Evidence of previous VTEC infection and outcome of illness will be sought. Together with the national surveillance system for VTEC, we will seek to identify factors associated with an increased risk of developing HUS, in the hope that we might, in the future, be in a position to prevent at risk children from developing HUS after a VTEC infection.

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Background

Haemolytic Uraemic Syndrome can develop, especially amongst children, after a period of diarrhoeal illness caused by Verotoxin-producing strain of *Escherichia coli* (VTEC). It has been estimated that within an average of four years after experiencing HUS, 9% of patients die, an additional 3% develop permanent end-stage renal dysfunction, and 25% demonstrate renal sequelae. An average of 920 cases of VTEC have been reported per year in the last five years, and it is thought that around 8% of cases develop HUS. However, a previous BPSU study conducted between 1997 and 2001 recorded 330 VTEC-related HUS cases, suggesting the proportion of cases developing HUS may be an underestimate.

Coverage

United Kingdom and Republic of Ireland.
Cases in Scotland will not be reported to the study. Data on Scottish cases will be collected through the Health Protection Scotland HUS/TMA Enhanced Surveillance.

Duration

October 2011 – October 2014 (39 months of surveillance). Follow-up until October 2015.

Research Questions

1. What is the annual incidence of HUS and how does it compare to the previous BPSU study?
2. What are the demographic and clinical features of HUS cases?
3. How many HUS cases do not have confirmed VTEC?
4. What proportion of HUS cases are 'mild' vs. 'severe'
5. Which VTEC strains cause HUS and do different strains cause mild and severe illnesses?
6. How are HUS cases managed currently?
7. What are the short-term and medium-term outcomes of HUS cases?
8. How many cases have been notified through Notification of Infectious Diseases (NOIDs)?

Case definition

Any child up to and including 15 years of age who, during the past month, has been diagnosed with haemolytic uraemic syndrome in the England, Wales, Northern or Republic of Ireland. Data for cases in Scotland will be collected through the Health Protection Scotland HUS/TMA Enhanced Surveillance.

Reporting instructions

England, Wales, Northern Ireland and the Republic of Ireland: Please report any child *up to and including* 15 years of age that you have seen for the first time in the past month and who has been diagnosed with HUS.

Please do not report children who have:

- septicaemia,
- malignant hypertension
- chronic uraemia
- primary vascular disease

Scotland: Please report cases of HUS to Health Protection Scotland as normal. Data from the Health Protection Scotland HUS/TMA Enhanced Surveillance will be used in this study.

If in doubt, or awaiting further tests, please report the child.

Methods

Surveillance

Active national surveillance of all children who fulfil the case definition will be undertaken through the BPSU in England, Wales, Northern Ireland and the Republic of Ireland. In Scotland, there is an existing HUS surveillance scheme. The questionnaire used in Scotland is comparable to the questionnaire in this study. Health Protection Scotland will provide study investigators with information on cases of HUS reported in Scotland and data from the completed questionnaires.

The details captured in the study questionnaire will be used to link the surveillance records with microbiological results in the national VTEC surveillance system. Cases in England will also be linked to the VTEC Enhanced Surveillance system which collects exposure details for cases of VTEC. As HUS is a statutory notifiable disease in England and Wales, cases will also be checked against the Notification of Infectious Diseases (NOIDs) system. Linking reported cases to these systems will allow us to evaluate completeness of data and to provide information on microbiological results and exposure history of cases.

Questionnaires

Reporting clinicians in England, Wales, Northern Ireland and the Republic of Ireland will be sent a link to an online questionnaire. Data will be entered into a secure web-based database, accessible only to key members of the investigation team. Those clinicians who prefer to complete a paper questionnaire will be sent a form for completion with a stamped address return envelope.

The questionnaire will collect demographic data including initials, sex, year of birth and partial postcode. Clinical data will include pre-existing conditions, clinical presentation on admission, laboratory investigations, case management, disease progression and clinical outcomes. Clinicians will be sent a link to a further online questionnaire at one year after diagnosis, to assess the medium term clinical outcomes.

Clinicians in Scotland will continue to report HUS to Health Protection Scotland, and to complete the Health Protection Scotland questionnaire. Data from this questionnaire will be provided to the study investigators for inclusion in this study.

Ethics approval

This study has been approved by London – Camberwell St Giles REC (Ref: 11/LO/1412). As of October 2010, HUS is a statutory reportable condition and this study falls under the existing Health Protection Agency permissions under the Section 251 of the NHS Act 2006.

Funding

Public Health England

Collaborators

Health Protection Scotland; Health Protection Surveillance Centre, Ireland; Public Health Wales; British Association of Paediatric Nephrologists; HUS Help

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