

ADVISORY COMMITTEE ON THE MICROBIOLOGICAL SAFETY OF FOOD

DISCUSSION PAPER

UPDATE ON LISTERIOSIS IN ENGLAND AND WALES

The ACMSF Ad Hoc Group on Vulnerable Group's report on increased incidence of listeriosis in the UK was published in September 2009. Attached is an update from the Health Protection Agency on listeriosis in England and Wales.

Members are invited to:

- Comment on the issues raised in this paper
- Review the appropriateness and delivery of current food safety advice for vulnerable groups in light of this evidence provided in this paper

**Secretariat
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ADVISORY COMMITTEE ON THE MICROBIOLOGICAL SAFETY OF FOOD

UPDATE ON LISTERIOSIS IN ENGLAND AND WALES, MARCH 2010

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Key issues and summary

- The epidemiology of human listeriosis has changed recently. Incidence had approximately doubled since 2001, with much of this increase occurring in older patients who present with bacteraemia (invasion of the blood stream) in the absence of central nervous system (CNS) infection. This increase has continued into 2009.
- The Committee was apprised of the increase in human listeriosis in England and Wales in September 2005 and received updates in June 2006, December 2006, June 2007 and December 2007.
- Considerable work has been undertaken by the Health Protection Agency (HPA) in the interim period to define more accurately the population at risk of listeriosis and to inform on the observed increase/changed disease presentation. Preliminary findings from this research demonstrate that a wide range of medical conditions give rise to listeriosis, that a variety of foods appear to increase the risk, and that ethnicity and deprivation appear to be important drivers for the disease.
- Members are requested to review the appropriateness and delivery of current food safety advice for vulnerable groups in light of this evidence.

Background.

1. Listeriosis is a rare but severe foodborne disease caused by the opportunistic pathogen *Listeria monocytogenes*. Primarily affecting the unborn, the newly delivered, the immunocompromised and the elderly, the disease normally presents as abortion, bacteraemia (invasion of the blood stream) or central nervous system (CNS) infections. Listeriosis is estimated to be the commonest cause of food-related deaths in the United Kingdom.
2. A change in the epidemiology in listeriosis has occurred in England and Wales since 2001. The number of reported cases has almost doubled, with much of this increase occurring in patients aged ≥ 60 years who present with bacteraemia in the absence of CNS infection. The increase cannot be explained by recognised outbreaks, regional differences, age, gender, or a predominant *L. monocytogenes* subtype. Similar increases have been reported in other European countries.

3. Members were first informed of a change in the epidemiology of *L. monocytogenes* infection in England and Wales at its meeting in September 2005. Additional data, presented at subsequent meetings, suggested that the altered epidemiological/clinical picture in England and Wales was not artefactual.

Update on epidemiological/clinical picture in England & Wales, 2008-9

4. Provisionally, 182 and 209 cases were reported in England and Wales in 2008 and 2009 respectively. Combined, the incidence in these years (3.59 cases per million (M) population¹ per year) was no different to that observed in 2001 to 2007 (3.57 cases/M/year; Relative Risk (RR) 1.01; 95% Confidence Interval (CI₉₅) 0.90-1.12), but 68% higher than the period 1990 to 2000 (2.14 cases/M/year; RR 1.68 CI₉₅ 1.50-1.88). The incidence in those aged ≥60 years reported during 2008 and 2009 (10.53 cases/M) far exceeded that observed in younger cases (1.62 cases/M/year; RR 6.52 CI₉₅ 5.29-8.02) and increased with increasing age 7.67, 11.07 and 16.16 case/M/year for 60-69, 70-79 and ≥80 year olds. Bacteraemia in the absence of CNS involvement remained the most common clinical presentation (289/372 patients where the source culture type was known; 78%).

Recent HPA research on the epidemiology of human listeriosis in England and Wales.

5. To understand the altered disease presentation, clinical, microbiological and seasonal data on bacteraemic cases of *L. monocytogenes* infection were compared with those for patients with CNS infections whilst controlling for age. Bacteraemic cases, who presented more frequently with gastrointestinal symptoms, were more likely to have underlying medical conditions than CNS cases. This was most marked in those with malignancies and with digestive organ malignancies in particular. Treatment to reduce stomach acid secretion modified the effect of non-malignant underlying conditions on outcome, i.e. cases with an underlying condition not taking acid-suppressing medication were no more likely to have a bacteraemia or CNS infection. However these therapies did not modify the effect of malignancies on having a bacteraemia or CNS infection.
6. To inform on the relative role of co-morbidities on the risk of listeriosis, patients' underlying conditions for the fiscal years 1999 to 2008 were coded according to the International Classification of Diseases version 10 (ICD-10) and compared with Hospital Episode Statistics Finished Consultant Episodes (FCEs). Incidence rates per million FCEs were calculated for each ICD-10 chapter and sub-group where 10 or more cases with co-morbidities were reported. A wide variety of conditions increased the risk of infection. Malignancies accounted for over a third of

¹ 2008 population data used as a proxy for 2009

conditions described and cancer patients had an almost fivefold increased risk of listeriosis and, within this group, cancers of the blood had the greatest impact. Other high risk/impact conditions include diabetes mellitus, alcoholism, certain diseases of the circulatory system and the musculoskeletal/connective tissue system, non-infective enteritis/colitis, as well as diseases of the liver and kidneys. For most high risk/impact conditions the risk of infection was significantly higher in older patients.

7. To investigate health inequalities which might exist in relation to listeriosis, cases reported in England from 2001 to 2007 with postcodes (~95% complete) were linked to Office for National Statistics Lower Super Output Areas, combined with 2005 Indices of Deprivation and merged with appropriate population data. Patient exposure data were scrutinised and compared with commercial food purchasing denominator data to further quantify the risk. Compared to the most affluent areas, disease incidence was higher in the most deprived areas of the country (RR 1.38 CI₉₅ 1.16-1.65). This effect was observed in patients aged ≥60 years (RR 1.36 CI₉₅ 1.09-1.71) and was more marked for pregnancy-associated cases (RR 2.20 CI₉₅ 1.18-4.08). Cases were more likely to purchase foods from convenience stores or from local services (bakers, butchers, fishmongers and greengrocers) than the general population, and their risk profile changed with increasing deprivation.
8. Standardised epidemiological information has been sought on cases of listeriosis since 2005, but the value of the data accrued is limited without some perception of exposure prevalence in the population at risk of listeriosis. The exposures of cases aged ≥60 years reported in England from 2005-2008 were compared to those of market research panel members representing the same population and time period. Exposures were grouped to facilitate comparison, with odds ratios and 95% confidence intervals calculated. Cases were more likely than panel members to report the consumption of cooked meats (beef and ham/pork; not poultry), cooked fish (specifically smoked salmon) and shellfish (prawns), dairy products (most noticeably milk but also certain cheeses) and mixed salads. They were less likely to report the consumption of other forms of seafood, dairy spread, other forms of dairy, sandwiches and fresh vegetables.
9. Following two coincident yet unconnected cases of pregnancy-associated listeriosis in 2008 in eastern European women, a review of the role of ethnicity in pregnancy-related listeriosis was undertaken. Cases were classed as “ethnic” (belonging to an ethnic minority) or “non ethnic” based on their name, and trends examined. The proportion of pregnancy-associated cases classed as ethnic increased from 16.7% to 57.9% from 2001 to 2008 (χ^2 for trend P=0.002) whereas this trend was not observed for non pregnancy-associated cases (χ^2 for trend P=0.124). The increase was most marked between 2006 and 2008, when incidence was higher than expected given the underlying population (RR 2.38 CI₉₅ 1.07-5.29, RR 3.82 CI₉₅ 1.82-8.03 and RR 4.33 1.74-10.77 respectively).

Conclusions.

10. Considerable progress has been made by the HPA in defining more accurately the population at risk for listeriosis in England and Wales. A wide range of underlying conditions increase the risk of infection, and the diversity of high-risk food groups identified might reflect this or the ubiquity of the microorganism in the environment. Ethnicity and/or deprivation appear to be important drivers for infection.
11. Active national surveillance of listeriosis, comprising detailed strain characterisation information coupled with standardised clinical and epidemiological data, informs greatly on the epidemiology of *L. monocytogenes* infection. Further research is required, however, to investigate patient treatments in relation to listeriosis, although stomach acid-suppressing medication appear to have a role.
12. United Kingdom food safety advice on the avoidance of foods which give rise to listeriosis is currently delivered passively and targeted preferentially at pregnant women. These studies indicate that there is added value in actively targeting appropriate food safety advice at a wider range of vulnerable groups.