

Sponsors: Swiss Society of Paediatrics (SSP) and Federal Office of Public Health (FOPH)

**Studied disease:**

**Listeriosis in neonates and infants in Switzerland**

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**Protocol summary:**

Listeriosis is most commonly caused by foodborne infection with the bacterium *Listeria monocytogenes*. In Europe, *Listeria* accounts for a minor fraction of all foodborne infections, but is an important contributor to severe foodborne illness [1]. Newborn infants are at high risk of serious disease outcomes, yet little to no information is reported on exposure, disease course or outcomes in neonates by mandatory case reporting in Switzerland. This study aims to collect epidemiological data on listeriosis in the newborn and in infants in Switzerland via the SPSU to gain an assessment of the epidemiological situation of neonatal listeriosis in Switzerland. In alignment to paediatric studies in Canada and the United Kingdom, the study will contribute to closing important gaps in knowledge on neonatal listeriosis.

**Begin of the study:**

1<sup>st</sup> of June 2017

**Duration of the study:**

Five years

**Aims of the study:**

Obtain epidemiological data on listeriosis in neonates and infants in Switzerland until the age of 6 months:

- 1) Determine
  - a. demographic information (age, sex, etc.)
  - b. incidence
  - c. manifestation
  - d. treatment and clinical course
  - e. disease outcome
  - f. exposure
- 2) Collect data on maternal and peri-natal risk factors of neonatal listeriosis and of more severe disease outcomes
- 3) Compare data to results of studies on neonatal listeriosis in Canada and the United Kingdom

**Background:**

Listeriosis is caused by infection with the gram-positive bacterium *Listeria monocytogenes* through ingestion of contaminated food such as dairy, meat and vegetable products or by mother-to-child transmission [2]. In Europe, although *Listeria* causes a small proportion of all foodborne disease, it contributes significantly to severe illness and accounts for approximately 4% of hospitalizations and 28% of deaths due to foodborne diseases [1]. At high risk of disease are the elderly, the immunocompromised, pregnant women and the newborn [3]. The newborn are at high risk of severe disease outcomes; infection during pregnancy normally passes with flu-like illness of the mother, but has serious outcomes in the fetus [1,6]. Infection during pregnancy can lead to abortion or stillbirth, or in the newborn

infant, to severe symptoms such as sepsis or meningitis [3]. Case-fatality rate can be up to 30% in newborns and if onset occurs in the first 4 days of life, case-fatality can be as high as 50% . In the long-term, a study showed that 23% of infected neonates have moderate to severe disability at 10-year follow-up [4].

Although listeriosis in the newborn is a serious concern, little information is collected on neonatal listeriosis through the mandatory notification system in Switzerland. Exposure, treatment and disease outcomes are not recorded. For cases of listeriosis occurring in infants past the first week of life (late-onset neonatal listeriosis as opposed to early-onset listeriosis), mode of acquisition and risk factors are also unknown [4].

There remain many unresolved questions concerning listeriosis in the newborn in Switzerland. Listeriosis in Switzerland is a relatively rare disease. Annually, only between 40 and 80 cases are reported [5]. Case numbers of listeriosis in neonates and infants are low at only 1-2 reported cases per year, but by means of a study performed within the framework of the nationwide network of paediatric clinicians participating in the *SPSU* and in alignment with studies in Canada and the United Kingdom, epidemiological data can be collected to start closing these gaps in knowledge on listeriosis in the newborn and in infants.

### **Methodology:**

Collect epidemiological data on neonatal listeriosis and listeriosis in infants until the age of 6 months from cases diagnosed by clinicians participating in the *SPSU*. On notification of a case of neonatal listeriosis by a paediatrician to the *SPSU*, the investigator sends out a questionnaire to the clinician, who returns the completed form with information on demographic factors, disease manifestation, treatment, disease outcome and risk factors.

### **Case definition:**

Newborns and infants up to the age of 6 months, meeting the following criteria:

- 1) Confirmed
  - a. Positive culture of *Listeria* from a usually sterile site, such as blood, CSF or pleural fluid; or
  - b. Positive culture of *Listeria* from the placenta in the presence of compatible clinical features of listeriosis (sepsis, meningitis, respiratory distress, etc.)
- 2) Probable
  - a. Positive PCR for *Listeria* from a usually sterile site or the placenta in the presence of compatible clinical features of listeriosis (sepsis, meningitis, respiratory distress, etc.)

### **Questionnaire:**

Appendix

### **Reporting instructions:**

The paediatrician notifies the *SPSU* of any cases meeting the above criteria via the monthly distributed report cards. The *SPSU* notifies the investigator, who sends a questionnaire to the paediatrician. The paediatrician returns the completed questionnaire to the investigator, including also a copy of the laboratory results.

### **References:**

- 1) David L. Heymann. Control of Communicable Diseases Manual. American Public Health Association 2015. eISBN: 978-0-87553-274-5
- 2) Farber JM, Peterkin PI. *Listeria monocytogenes*, a food-borne pathogen. Microbiological Reviews. 1991;55(3):476-511.
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- 4) Okike et al. Do we really need to worry about *Listeria* in newborn infants? The Pediatric Infectious Disease Journal. Volume 32, Number 4, April 2013
- 5) Bundesamt für Gesundheit. Listeriose. Available at: <https://www.bag.admin.ch/bag/de/home/themen/mensch-gesundheit/uebertragbare-krankheiten/infektionskrankheiten-a-z/listeriose.html>. Accessed January 18, 2017.
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