Bacterial meningitis is a medical emergency. Prompt recognition and management is required for best outcome. Using several surveillance systems (including the BPSU, national laboratory systems, neonatal infection network and meningitis charities), we showed that the incidence has not declined amongst UK young infants in contrast to other age groups. These young infants also had a rate 70 times those of adults. We identified that nearly half of the infants did not present with fever and that there is no progression of features in the first 24 hours in contrast to what is known about children with meningococcal disease.

Additionally, there was a wide variation in management of infants including empiric antibiotics and the role of listeria has been over-estimated over time leading to wide use of a penicillin based antibiotics including infants over 1 month of age. There was also variation in follow up practice.

The findings of the our studies in addition to literature review forms the basis of our bacterial meningitis management algorithm and etool aimed at trainee doctors to communicate lessons from our research, highlight gaps in recognition and management and promote best practice.

We used anonymised case studies to create modules about recognition of clinical features, decision making, investigations, management and follow-up. We addressed key issues around timely lumbar puncture, appropriate empiric antibiotics and requirement for on-going monitoring.

The etool has been endorsed by the RCPCH and passing a test at the end of it will allow the user to collect CPD points. A pilot roll out received positive feedback with 90% rating it as useful or very useful and 97% saying that they would recommend the etool to a colleague.

We believe that this educational package will contribute to improved outcomes for these vulnerable infants. Parents of survivors show appreciation for our dissemination of the findings to improve the management of future cases. We have demonstrated the huge potential benefit of collaboration between all the surveillance systems especially when dealing with rare diseases. Our study is the pioneer BPSU study to produce a management etool.

18 KAWASAKI DISEASE – USE OF SURVEILLANCE DATA TO IMPROVE MANAGEMENT AND AWARENESS

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Background Kawasaki disease (KD) is the commonest acquired heart disease in the Western world. A British Paediatric Surveillance Unit (BPSU) study was to ascertain national incidence and demographics of KD compared to the last survey 20 years ago. In May 2016, an NHS England patient safety alert (PSA) was announced. Patients with coronary artery aneurysms (CAA+) were to be alerted to the PSA, recalled and to receive a patient specific protocol. In parallel, we wished to determine if admissions with KD increased recently.

Methods Those with KD were captured by the survey in the UK and Ireland between 02.2013 and 02.2015. BPSU 'orange card' methodology led to anonymous registration by paediatricians who completed a study questionnaire. Ethical and national information governance board approval avoided the need for consent. We also conducted a Freedom of

information (FOI) request in order to gain more knowledge about the current situation in the UK.

Results 553 children with KD satisfied inclusion criteria, boys: girls was 1.4:1, age range 2 months to 15.5 years. Most had complete disease but 119 had incomplete and 42 atypical disease. In those under 1 year of age, 51% were CAA+. Overall, 355 (68%) were Caucasian, but black African and ethnic Asian were over-represented. Peak incidence was January-March. There was an inverse relationship with population density, being most common in rural areas. Median time to treatment for the 24% of children with CAA + was 10.2 days compared to 6.8 days for those without. The FOI showed that incidence has been rising fast, increasing four-fold over the last 10 years. There has been little response to the PSA, with only 11 Trusts intending to inform patients. Many hospital trusts have no guidelines at all.

Conclusions We have made little improvement in managing KD. A marked increase in admissions in the UK coded as KD over the 10 years from 2006–2015 is associated with poor levels of awareness with late diagnosis beyond the recommended 5 days, with frequent CAA and long-term consequences. The survey and FOI will now inform new nationally agreed guidelines and an awareness and educational programme across the UK.

19 LISTERIOSIS IN NEONATES AND INFANTS IN SWITZERLAND AND CANADA

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Aims Neonates and infants with listeriosis are at high risk of serious disease outcomes, yet in many countries, little information is reported in routine surveillance. This study aims to begin closing this gap.

Methods Clinicians participating in the Swiss Paediatric Surveillance Unit (SPSU) or the Canadian Paediatric Surveillance Program (CPSP) recorded cases of listeriosis in neonates and infants up to the age of 6 months with information on demographic indicators, manifestation, treatment, clinical course, outcome, exposure and maternal and perinatal risk factors collected.

Results In Switzerland four cases occurred over the first 8 months of the study (April to November 2017). Half of the infants had early-onset disease (EOD, defined as onset of symptoms < 7 days of life (DOL)) and the other half had late-onset disease (LOD, defined as onset of symptoms > 7 DOL). EOD is considered to be mother-to-child transmitted, while the pathogenesis of LOD is unclear. All cases manifested with sepsis and meningitis, and one EOD case presented with skin and mucosal lesions as well. All infants made a full recovery with antibiotic treatment with no long-term sequelae noted. Notably, three of the four cases occurred in one hospital during the same week. However, it could not be established

whether infection resulted from an epidemiological link between the cases.

The Canadian study collected data over 2 years (May-2015 to April-2017). Eight cases of laboratory-confirmed listeriosis were reported in newborns and infants. Six cases had EOD and 2 had LOD. All the six EOD cases presented as septic on DOL 1 (median: 0.5 hours, range: 0–2 hours). All EOD cases had bacteremia and one also meningitis. All EOD cases needed ICU (or NICU) admission; 2 of the EOD cases died. Of the LOD cases, one case became symptomatic on DOL 9 and the other presented on DOL 20 with seizures. Both LOD cases survived the episode, but in one case, the infant suffered permanent sequelae (hemiplegia).

Conclusion While the incidence of neonatal listeriosis recorded in Switzerland exceeded the incidence as could be expected from routine surveillance data, this increase likely related to the unusual cluster of cases. Contrary, the number of cases reported in Canada was far below the incidence as could be expected from the reported incidence of neonatal listeriosis in the literature (table 1). Under-reporting was unlikely as no additional listeriosis were reported through the national notifiable system. This apparent reduction in incidence of EOD could reflect perinatal antibiotic prophylaxis for Group B streptococcus; conclusions about LOD will require longer study period.

Abstract 19 Table 1

	Switzerland	Canada
Study duration [months]	8	24
Number of cases	4	8
Incidence/100'000 live births	4.5	1
Sex ratio (M:F)	1:1	1:1.7
Gestational age at birth [range of weeks completed]	34–39	25–41
Birth weight [range in g]	2220–3770	880–3900
Age of infant at onset of symptoms (range)	17 hour – 8d	0–20 d
Ratio of early- to late-onset disease	1:1	3:1

110 ADHERENCE TO TREATMENT AND REDUCTION IN BMI SDS ASSOCIATED WITH LOWER HBA1C, 1 YEAR AFTER DIAGNOSIS OF TYPE 2 DIABETES IN YOUTH

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Objective To report outcomes from a national cohort of children and young people with type 2 diabetes (T2DM), 1 year post diagnosis

Research design and methods

1 year follow up of a cohort of children (<17 years) with T2DM reported through the British Paediatric Surveillance Unit between April 2015 to April 2016. This established an overall UK incidence of 0.72 per 1 00 000 per year (2.92/100,000 in Asians, 1.67/100,000 Black/African/Caribbean/Black British)

Results Ninety-nine (93%) of the 106 notified cases had data available for one-year review. Of these, seven had been lost to follow up and one had the diagnosis revised. The mean age at follow up was 15.3 years. Of those with data, average BMI SDS was 2.72 with a mean increase of 0.14 SDS over a year (92% remained overweight or obese). Only ~15% of cases achieved a reduction in body weight of 5% or more from baseline. Median HbA1c was 53 mmol/mol (range 31–130 mmol/mol) and ~40% attained the UK national target of <48 mmol/mol. HbA1c was associated with BMI SDS change at 1 year ($p=0.007$) and clinician reported compliance and attendance concerns ($p\leq 0.0001$). In over half of cases, clinicians reported issues with compliance and attendance. Mean clinic attendance was 77%. Metformin was the most frequently used agent in management at baseline (77%) and follow up (87%). Microalbuminuria at 1 year was seen in 16.4% of cases compared to 4.2% at baseline.

Conclusions Good compliance and BMI reduction is associated with better outcomes, one year after diagnosis in early onset T2DM. It is concerning that the prevalence of microalbuminuria increases four-fold in this short time frame.

111 21 YEARS OF SURVEILLANCE FOR VITAMIN K DEFICIENCY BLEEDING IN INFANTS: POLICY CHANGES IN AUSTRALIA AND INTERNATIONAL COMPARISONS

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Background The NHMRC recommends Vitamin K at birth for the prevention of Vitamin K Deficiency Bleeding (VKDB). Intramuscular injection (IMI) is the preferred route of administration but oral dosing may be chosen. We describe the incidence and outcome of VKDB during changes in vitamin K prophylaxis policy and the introduction of a new formulation of Vitamin K.

Methods Infants with VKDB were identified by active surveillance through the Australian Paediatric Surveillance Unit (APSU), 1993–2012. Demographics, clinical characteristics and outcomes were collected via questionnaire completed by the reporting doctor.

Results Fifty-one cases of VKDB were reported; 36 late onset and 15 early/classical. Twenty-seven (53%) infants received no vitamin K, in 22 (81%) of these parents refused consent, and this was the case in 92% of the 12 home births. The national incidence of VKDB was 0.9/100,000 live births per annum. Higher incidence was detected in 1993 (4.6/100,000) when oral dosing was recommended and in 2000 (2.3/100,000) coinciding with changes in Vitamin K formulation to enable oral dosing. Of 7 infants who received oral doses of Vitamin K, only 1 received the complete course of 3 doses. Surprisingly, 6 cases of VKDB were reported in 2013 (2/100,000); parents refused consent in 5.

Thirty-one (61%) infants had a good outcome after bleeding was corrected with vitamin K. Ongoing morbidity was almost exclusively confined to those with late onset VKDB (12/36, 30%) and related to underlying liver disease, or intracranial haemorrhage. Six (12%) infants died including one in 2013 due to intracranial