In the four groups with the highest initial HbA1c, improvements were seen when comparing Pre-LD to both Post-LD and Av-Post-LD, with the >69 group improving by 9.73mmol/mol and 10.18mmol/mol respectively. Only the two highest groups demonstrated a sustained improvement. In the two groups with the lowest initial HbA1c, a slight deterioration was seen when comparing Pre-LD to both Post-LD and Av-Post-LD, with a trend towards deterioration.

Conclusions Perhaps unsurprisingly, HbA1c testing fell during lockdown and never returned to pre-lockdown levels, highlighting the pandemic's disruption to the care of patients with long-term conditions. Contrary to guidance, 14.73% of patients were not tested in the nine months post-lockdown, potentially reflecting reluctance to attend hospital during the pandemic. Nevertheless, where results were available, lockdown seemed to have a positive impact on HbA1c despite the enforced use of telemedicine, unless the patient was already close to target. It is possible that lockdown provided more routine and parental supervision for those with initially high HbA1c but disrupted the successful routine and sporting activities of those initially closer to target.

British Paediatric Allergy Immunity and Infection Group

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DIAGNOSING EARLY-ONSET NEONATAL SEPSIS IN LOW-INCOME AND MIDDLE-INCOME COUNTRIES: DEVELOPMENT OF A MULTIVARIABLE PREDICTION MODEL FROM ROUTINE CLINICAL DATA

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Background Neonatal sepsis causes 15% of global neonatal deaths. Non-specific clinical features and unavailability of laboratory tests in many low-income and middle-income countries make it difficult to diagnose. Clinical prediction models could support timely, accurate diagnosis of neonatal sepsis and rationalise antibiotic usage. The NeoTree app is an Android-based quality improvement platform embedded into clinical practice at two neonatal units in Malawi and Zimbabwe. It combines evidence-based clinical decision support, education on neonatal care and immediate digital data capture.

Objectives We aimed to develop a clinical prediction model to diagnose neonatal sepsis with routine clinical data, without the need for laboratory tests.

Methods We analysed secondary data from an ongoing quality improvement project at the neonatal unit of Sally Mugabe Central Hospital, Zimbabwe, collected via the NeoTree app. We included neonates admitted from 1 February 2019 to 31 March 2020 aged <72 hours, born at $\geq 32^{+0}$ weeks with birth weight ≥ 1500 grams. We developed a clinical prediction model with multivariable logistic regression for the outcome of early-onset neonatal sepsis (EOS, <72 hours) as defined by

the treating consultant neonatologist. Candidate predictors were identified from expert opinion and literature review. Missing data were imputed using multivariate imputation with chained equations. We first fitted a 'full' main effects model containing all candidate predictors. We then examined several variations on the full model and selected the model favoured by the Bayesian information criterion. Performance was evaluated in the derivation cohort with the area under the receiver operating characteristic (ROC) curve (AUC) and sensitivity, specificity, predictive values and likelihood ratios at various thresholds of predicted probability.

Results We included 2627 neonates with mean gestational age 38.0 ± 2.5 weeks and mean birth weight 2889 ± 703 grams. EOS was diagnosed in 297 neonates (11.3%). The final model included eight predictors: maternal fever, foul-smelling liquor, prolonged rupture of membranes, neonatal temperature, respiratory rate, activity, chest retractions and grunting. ROC analysis gave AUC = 0.735 (95% confidence interval 0.699–0.771). For a sensitivity of 95 (92–97)%, corresponding specificity = 15 (13–16)%, positive predictive value = 12 (11–14)%, negative predictive value = 96 (93–98)%, positive likelihood ratio = 1.12, and negative likelihood ratio = 0.32.

Conclusions Our clinical prediction model for EOS achieved high sensitivity but with only modest specificity in the derivation cohort. This suggests our model may be best suited to ruling out a diagnosis of EOS, which may support healthcare workers' decisions to withhold antibiotics and prevent unnecessary antibiotic exposure in non-septic neonates. Future work will validate and refine this model before incorporating it into the NeoTree app for clinical use.

British Society of Paediatric Gastroenterology, Hepatology and Nutrition

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D LACTIC ACIDOSIS – IS IT MORE PREVALENT CONDITION THAN WE THINK?

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Background D-lactic acidosis is a known complication in children with short bowel syndrome. The unabsorbed carbohydrates are fermented by colonic bacteria to form D-lactic acid among other organic acids. They typically present with episodic metabolic acidosis and characteristic neurologic abnormalities including confusion, ataxia and slurred speech. Routine clinical assessment of serum lactate covers only L-lactic acid; when clinical suspicion for D-lactic acidosis is high, special assays for D-lactic acid are needed. Standard treatment consists of restricting oral carbohydrates or fasting, correction of acidosis, and long-term suppression of pathogenic floras with antibiotics.

Objectives To create more awareness of D-lactic acidosis and promote early detection as well as more effective management.

Methods A retrospective case notes review with short bowel syndrome identified 3 children presenting with d-lactic acidosis over a 10-year period at tertiary care hospital.

Results All 3 patients presented with neurological symptoms which pose a diagnostic challenge as often confused with primary neurological disorder. All the differential diagnosis including nutritional, metabolic and neurological was considered and excluded. The acute episode management included IV fluids, sodium bicarbonate correction, strict restriction of enteral carbohydrates with resolution of symptoms within 24–48 hours. Patient 2 required insulin which helped resolve the acidosis swiftly. She continued to present with recurrent D lactic acidosis despite low carbohydrate diet, cycling antibiotics, STEPP procedure for bowel dilatation, D lactate free probiotics and currently established on partial parenteral nutrition. Patient 1 is doing well on carbohydrate restricted diet only. Patient 3 remains on restricted diet, antibiotics with active weaning of parenteral nutrition. Recolonization of the intestine with non-pathogenic floras remains a long-term treatment goal.

	Patient 1	Patient 2	Patient 3
Age at Presentation/ Gender	5yrs/M	5yrs/F	1.8yrs/F
Presenting symptoms	Unsteady gait and slurred speech	Ataxia, slurred speech, drowsiness and inability to sit.	Vomiting, decreased oral intake, ataxia and feeling generally unwell
Underlying diagnosis	Gastroschisis	Complex gastroschisis	Necrotising enterocolitis
Bowel length	8cm of small bowel from DJ flexure with jejuno-colic anastomosis	50cm from DJ flexure with jejuno-colic anastomosis	23cm from DJ flexure with jejuno-colic anastomosis
Presence of ileocecal valve	No	No	No
Colon present	Yes	Yes	Yes
Bowel lengthening procedure	Yes	Yes	No
Parenteral Nutrition	None	4 days a week	3 days a week
Cyclical get decontamination	Yes	Yes	Yes
D lactate level at the time of presentation	>582 micromol/L	>10,000 micromol/L	6000 micromol/L
Weight	25th centile	50th centile	25th -50th centile
Height	50th centile	9th-25th centile	50th centile

Conclusions D lactic acidosis is an uncommon condition, but likely an under recognized syndrome. Physicians should be aware of the risk factors and presenting symptoms while keeping a high index of suspicion, as early detection leads to effective management of the condition. Diagnosis is made by a combination of clinical and laboratory data including special assays for D-lactate. Although there is safe and effective treatment strategies, multidisciplinary approach, compliance to dietary recommendations help reduce the incidence but in rare cases novel emerging therapies need to be considered.

British Society of Paediatric Endocrinology and Diabetes

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AUDIT OF HbA1c OF CYP IN BARNET & CHASE FARM DIABETES SERVICE BETWEEN 2012–19 TO ASSESS IMPACT OF CARB COUNTING AT DIAGNOSIS AND INTRODUCTION OF PUMP SERVICE

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Background Type 1 diabetes (T1D) is associated with reduced life expectancy[1]. Poor metabolic control in childhood strongly correlates with premature death in adulthood[ii]. For children and young people (CYP) with T1D, improvements in glycaemic control, as measured by glycated haemoglobin (HbA1c), reduces the risk of developing long-term complications. HbA1c at 1-year post diagnosis is a strong predictor of future glycemic control[2]. Since 2016 NICE has recommended CYP with T1D aim for a HbA1c of ≤ 48 mmol/mol. Level 3 carbohydrate counting soon after diagnosis and intensive insulin management are important tools in achieving this [3 4].

Objectives Our aim was to identify the impact of introducing carbohydrate counting from diagnosis and the development of an insulin pump service on glycaemic control.

Methods Barnet and Chase Farm hospitals current caseload of CYD with T1D is 165. In 2014 the trust merged with the Royal Free London NHS trust, with an additional 50–60 CYP. We conducted a retrospective audit of all CYP diagnosed with T1D within the Barnet and Chase Farm paediatric service between April 2012 and March 2019. Patients were analysed in yearly cohorts to mirror the National Paediatric Diabetes Audit cycle. HbA1c was categorised into <48 , <58 and >80 mmol/mol at 1-year and 2-year post diagnosis. Comparison was made between years, noting significant changes in the local service, such as the introduction of carbohydrate counting from diagnosis and the insulin pump service.

Results A total of 149 CYP were diagnosed with T1D at Barnet and Chase Farm Hospitals over the period (average 21/year). 29 patients left within the first year, leaving 120 for analysis. There is improvement in glycaemic control at 1-year across the audit period (graph 1). Increasing numbers of CYP achieve target HbA1c <48 mmol/mol (10% 2013 versus 31% 2019) and fewer have extremely poor control with HbA1c >80 mmol/mol (26% 2013 versus 6% 2019). Improvements in patients achieving lower HbA1c is noted after the introduction of carbohydrate counting from diagnosis in 2015, whereas a reduction in very poor control is evident after the pump service began in 2017. These changes are sustained at the 2-year HbA1c (Graph 2). Mean HbA1c for the all service users improved over the same period (76.2mmol/mol to 67.7mmol/mol).

Conclusions The introduction of carbohydrate counting at diagnosis and the development of a local pump service positively impacted glycaemic control of new patients with T1D at 1-year. Such early changes are likely to improve long-term HbA1c and reduce the risk of complications from diabetes.