

introduction of a standardised hyperglycaemia guideline<sup>3</sup> which resulted in babies not receiving restricted glucose amounts in their PN by day 5 (16g/kg/day compared to an average of 9g/kg/day previously). More than 90% of babies in this cohort remained on standardised PN, compared to 15% when first introduced.

**Conclusion** Following the introduction of standard additions of sodium glycerophosphate and the slower titration regimen for babies weighing less than 1.5kg, most babies were now tolerating standardised PN and it was deemed a suitable regimen for this cohort. NICE recommended nutritional support<sup>1</sup> was reached by day 5 of PN. The introduction of a hyperglycaemia management guideline also standardised the use of insulin in this cohort, resulting in glucose reduction in PN being required less frequently.

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## UNLICENSED MEDICINES USE IN NEONATES: DO WE KNOW WHAT WE'RE GIVING?

Thomas Wyllie\*, Jessica Girvin. Cardiff and Vale University Health Board

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**Background** The use of unlicensed and off-label medicines is common within neonatal intensive care.<sup>1</sup> Their use presents challenges, including inconsistent supply, high cost and lack of information together with increased risk of medication errors and adverse drug reactions.<sup>1 2</sup> Despite these significant drawbacks, the dearth of products licensed for the neonatal population necessitates the routine use of these medicines.<sup>3 4</sup>

'Unlicensed' describes medicines that do not have a marketing authorisation, whereas an off-label medicine is a licensed product used outside of the terms of its licensing, i.e., for a different age, dose or route.<sup>2</sup>

**Aim** Determine health care professional's (HCP's) knowledge of the license status of medicines in common use on a tertiary neonatal unit. Explore how confident they are in using unlicensed and off label medicines.

**Method** A survey was developed to examine the views of HCPs regarding unlicensed medicines and their knowledge of the licensing status of medicines used routinely in their practice. Doctors, nurses and advanced neonatal nurse practitioners (ANNPs) working on a tertiary neonatal unit were invited to complete the survey.

The survey asked whether HCPs felt they understood what unlicensed medicines were and whether they thought they knew the license status of the medicines they prescribe/administer. A second section was a list of 20 commonly used drugs and HCPs were asked to specify for each if it was a licensed, unlicensed or off-label use.

**Results** All HCP respondents (n=28) answered that they understood the concept of unlicensed medicines (partially or fully) and that they were confident in using them (89% reported confidence  $\geq 3$  out of 5).

Tested on their knowledge of the license status of specific medicines, the average number of medicines that each respondent correctly identified was 8.9 out of 20 (range 5-13, median 9). Prescribers who scored themselves higher on the question 'Do you know the license status of the medicines you prescribe?' knew the license status of more medicines when tested (correlation coefficient = 0.775,  $p=0.0002$ ). This correlation was not observed for nurses and there was no correlation with number of years of experience within neonatology.

Only a minority of prescribers (three) said they would look up the license status of a medicine before prescribing. When asked what resource they would use to find out the license status, most respondents said British National Formulary for Children.

**Conclusion** HCPs working on a tertiary neonatal unit reported that they understood the concept of unlicensed and off-label medicines and felt confident in prescribing and administering them. However, there is a lack of awareness of the licensing status of drugs in common use. Prescribers had good insight into the gap in their knowledge but did not seek out information on medication license status before prescribing.

The routine use of medicines outside their product licenses may have created a culture where there is felt to be no need to be aware of the status of a specific medicine. Further research is warranted into how to best communicate the license status of medicines to HCPs.

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## OFF-LABEL USE OF INTERLEUKIN-6 INHIBITORS IN PAEDIATRICS: A SYSTEMATIC REVIEW

<sup>1</sup>Hafsah Badshah\*, <sup>2</sup>Mandy Wan, <sup>1</sup>Asia N Rashed. <sup>1</sup>Institute of Pharmaceutical Science, King's College London; <sup>2</sup>Evelina London Children's Hospital, Guy's and St Thomas' NHS Foundation Trust

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**Aim** Elevated Interleukin-6 (IL-6) is associated with the pathogenesis of various chronic inflammation and autoimmune conditions.<sup>1</sup> Currently, only three IL-6 inhibitors, tocilizumab, siltuximab and sarilumab, are approved for a limited number of conditions in adults, and only tocilizumab is licensed in children.<sup>2</sup> However, off-label use of these drugs has been reported in paediatrics. This review aimed to summarise the evidence base for the off-label use of these three IL-6 inhibitors in children, the indications for off-label use, and the doses prescribed. The nature of adverse events associated with the off-label use of these drugs and the clinical effectiveness were also identified.

**Method** A systematic search was conducted on EMBASE, Medline, and PubMed; studies published in the English language between 2009-2020, reporting the off-label use of tocilizumab, siltuximab and sarilumab in children aged 18 years or under were included. Data screening and extraction were

performed independently by two reviewers. The quality of included studies was assessed using the Newcastle-Ottawa quality assessment scale for cohort and cross-sectional studies, and the National Institutes of Health quality assessment tool for case series. The review was conducted and reported in accordance with the PRISMA guidelines for systematic reviews<sup>3</sup> and was registered on PROSPERO with registration number CRD42021221631.

**Results** In total 81 studies were included in the systematic review, with 18.5% (15/81) studies deemed of good quality, 24.7% (20/81) studies of fair quality, and 56.8% (46/81) studies of poor quality. Almost all of the studies (99%, 80/81) were on tocilizumab. Only one study investigated siltuximab and none were found for sarilumab. The total number of patients included in the identified studies was 211 (210-tocilizumab, 1 siltuximab). For tocilizumab, the most frequently reported clinical indication was the management of complications associated with hematopoietic stem cell transplantation (24.3%, 51/210) followed by its use in the treatment of severe acute respiratory syndrome coronavirus 2 (SARS-COV-2) (17.5%, 14/80).

Overall, tocilizumab was prescribed for 28 unlicensed indications, and the dose varied from 4 to 12 mg/kg. Dosing frequency was reported in 98.7% (79/80) of tocilizumab studies, with 'every two weeks' prescribed most often (53.2%, 72/79). Adverse events were reported in 20.4% (43/211) of patients of which 32.6% (14/43) experienced adverse events, e.g. respiratory tract infections (n=2) and low platelet counts (n=2). The clinical outcome of the off-label use of tocilizumab was described to be successful in 55% (44/80) of studies, with reported success in the treatment of SARS-COV-2 and uveitis (13.6%, 6/44, each). The article on siltuximab reported no clinical outcomes.

**Conclusion** This is the first systematic review of the off-label use of IL-6 directed therapies in children. The limited data suggest that tocilizumab may be effective in a number of off-label indications, but the quality of available evidence is low and there remains the need for adequately powered and well-designed studies to support its use in clinical practice. The findings of this review should be used as a basis to inform future clinical trials in paediatrics.

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## PRIMARY PHARMACEUTICAL CARE AND YOUNG PEOPLE: EXPLORING YOUNG PEOPLE PERSPECTIVES

Mohammed Almunef\*. *University of Birmingham*

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**Introduction** According to recent literature, the prevalence and incidence of long-term illnesses such as asthma and diabetes in young people has substantially risen over the past 13 years.<sup>1</sup> Recent figures indicate that, in England, 4.1% of all prescriptions were prescribed for young people. More than 45 million prescriptions were dispensed for young people in 2017 by pharmacists.<sup>2</sup>

**Aim** The aim of this study was to investigate young people's perspectives of the pharmaceutical services that are provided from primary care pharmacists relating to medication.

**Method** A cross-sectional survey using both the online and paper-based tools was conducted from March to November 2019. The population for this survey was young people from age 18 to 24 years registered as students at one of the universities in the UK. The survey consisted of twenty-four questions and they were a mix of closed-ended questions such as multiple choice and Likert scale and open-ended questions. This research gained ethical approval from the Ethics Committee of the same University (ERN\_17-1672).

**Results** A total of 210 survey responses were returned. Most of the participants were female (62.4%). The most frequent age was 18 years (35.2%). Among participants, 15.7% were diagnosed with long-term illnesses and the majority of them (33.3%) were diagnosed with respiratory disease all of which was reported as asthma. Pharmacists were not utilised as a source of information for young people whereas the majority (60.6%) obtained information from their doctors. Most of the participants (97%) had not taken part in an MUR or NMS and 78.8% of them had never been told about any services or support groups by their pharmacist.

**Discussion and Conclusion** There is a lack of provision of pharmaceutical services and support by primary care pharmacists to young people with long-term illnesses. Previous evidence shows that this could be due to a lack of confidence when dealing with young people, unwillingness of pharmacists to take on more responsibilities, or a lack of training and support.<sup>3</sup> The results would be of benefit to the policymakers to assist in the further growth of the pharmacy services. Further research will enhance understanding of the perceptions of young people about the pharmaceutical services that are offered by primary care pharmacists with respect to medications.

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## ASSESSING COMPLIANCE WITH OXYGEN PRESCRIBING IN PAEDIATRICS

Nicole Aubury\*, Andrea Gill, Catrin Barker, Andrew Taylor. *Alder Hey Children's Hospital*

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**Aim** The National Patient Safety Agency Rapid Response Report<sup>1</sup> and British Thoracic Society (BTS) guidelines<sup>2</sup> state that oxygen should be prescribed. Following the introduction of electronic prescribing in a specialist children's hospital, there was a reduction in the number of patients whose oxygen was prescribed. A series of audits were undertaken to determine how often oxygen administration was accompanied by a valid prescription and whether a variety of interventions affected prescribing.

**Method** Eight paediatric wards in a specialist children's hospital were included in the audit. Critical care and the Emergency Department were excluded. A total of 4 audits were