RELIABLE RESULTS IN CONTINUOUS BIOANALYSIS OF APREPITANT IN THE PREVENTION OF CARDIOTOXIC ADVERSE EFFECTS OF DOXORUBICIN IN THE PAEDIATRIC POPULATION – A SYSTEMATIC LITERATURE INVESTIGATION

M Feickert*, BB Burckhardt. Institute of Clinical Pharmacy and Pharmacotherapy, Heinrich Heine University, Düsseldorf, Germany

Background As the initiator of the Renin-Angiotensin-Aldosterone system, renin plays an essential role in the vicious circle of heart failure. Therefore, renin was determined in the investigators driven ‘Labelling of Enalapril from neonates up to adolescents’ (LENA) study to evaluate its role in paediatric heart failure. Due to the often long-lasting periods of recruitment of paediatric subjects, the assay performance has to be guaranteed over the whole recruiting time. Therefore, to ensure the high quality of the determined renin study samples after successful assay validation, a multi-step quality approach was used to get reliable results over a period of 30 months.

Methods Based on a multi-step quality approach consisting of calibration standards (CSs), quality controls (QCs) and incurred sample reanalysis (ISR), study samples of unknown renin concentrations were determined. Results within predefined limits of CSs (6 levels) and QCs according to European Medicine Agency (EMA) guidelines were required for evaluating the study samples. ISR was performed for randomly selected paediatric samples to evaluate the long-term accuracy of the validated assay.

Results 133 analytical runs were conducted for renin from February 2016 to August 2018. In 119 (88.8%) valid runs, a total number of 1414 of CSs and 952 of QCs were determined. Thereof 99.9% of CSs and 98.3% of QCs were in the predefined limits according to EMA. 143 incurred sample pairs were reanalysed resulting in 95.8% of samples within EMA guidelines. Using this multi-step quality approach, the reliable determination of 965 LENA paediatric study samples was guaranteed.

Conclusion In addition to the assay validation, the multi-step quality approach ensured the reliability of the determined renin concentrations in the continuous bioanalysis of the paediatric study samples and guaranteed the high quality of the collected data in the LENA study.

REFERENCES
What can be learnt from serious drug related medical errors in pediatric patients in Gothenburg 2015–2017?

S Fjeldsted*, Drottning Silvias Barn Sjukhus (DSBUS), Barnmedicin, Sahlgrenska University Hospital, Göteborg, Sweden

Background 2017 a rise in serious drug related medical errors in pediatric care at Sahlgrenska University Hospital was discovered. 2018 a pediatric Clinical Decision Support System (CDSS) called ePed with weight based dose calculation, dosage control and easy access to pediatric drug information was integrated with the Electronic Medical Record.

Aim Analyze causes and underlying factors to serious drug related medical errors, labeled Lex Maria, in children and further evaluate if these errors could be prevented within the framework of ePed.

Method 28 Lex Maria cases in children ≤16 years were registered during 2015–2017 at Sahlgrenska University Hospital, Gothenburg. These were analyzed and summarized according to type of error, underlying cause and when during the drug managing process the error occurred. Finally, comparison between years was made.

Results 2015 and 2016 five Lex Maria cases occurred respectively, 2017 the number increased to 18 cases. Most commonly the patients received an incorrect dose. Errors divide equally between prescription, preparation and administration. Drugs requiring dilution were of certain risk especially when diluted in several steps. Midazolam was the most frequently involved drug. In 2017 especially one ward stands out in numbers and was responsible for 10 of the 18 cases.

Conclusions ePed will help to avoid human calculation errors in prescription and provides easy access to pediatric drug information facilitating drug preparation and administration. Nurses are particularly exposed to medication incidents since they usually are the last link to the patient and need to be their own control. High-risk medicines need to be identified and made safe. A complex interplay between individual/human and systemic factors contribute to errors. However, to reduce serious drug related errors a CDSS is of great value but adequate education for medical staff, both pharmacologically and about the system is vital. Future follow up will be needed.

Disclosure(s) Nothing to disclose

REFERENCE RANGES OF BLOOD NT-PROBNP IN PAEDIATRIC HEART FAILURE AND HEALTHY CONTROLS: COMPILATION OF LITERATURE DATA

T Gangnus*, FK Suessenbach, N Makowski, I Burdman, S Laeer, BB Burckhardt. Institute of Clinical Pharmacy, Heinrich Heine University, Dusseldorf, Germany

Background N-terminal pro-brain natriuretic peptide (NT-proBNP) is a valuable biomarker for diagnosis and prognosis of heart failure in adults, included into the European Society Guidelines for heart failure (2016). It is also considered as a diagnostic and follow-up marker in paediatric heart failure. The aetiology of paediatric heart failure is heterogeneous and maturation of the cardiac and neurohumoral system influences NT-proBNP levels. Since substantial information is mandatory to enable a long-term follow-up of children with heart failure, the aim was to collect published paediatric NT-proBNP data.

Methods In January 2019, a literature search using PubMed was performed comprising the following keywords: NT-proBNP, heart failure/dilated cardiomyopathy/congenital heart defect/congenital heart disease/healthy and child/neonate/toddler/infant/paediatric. Eligible publications had to determine levels of NT-proBNP in plasma or serum in paediatric heart failure or healthy children (0–18 years) with the Roche NT-proBNP-immunoassay.

Results The search resulted in 343 records, of which 95 measured NT-proBNP in paediatric controls or heart failure. Of them, 48 studies were excluded due to the use of other immunoassays. Following, 47 studies were included into the analysis of which 27 reported NT-proBNP levels in 3435 healthy children and 38 NT-proBNP concentrations in 1885 children with heart failure. The age range of reported levels comprised the day of birth up to 18 years in both groups. The data set revealed that younger children have higher NT-proBNP values than older children and that heart failure patients had increased NT-proBNP levels compared to healthy controls which are also dependent on the severity of disease.

Conclusion The literature search and analysis confirmed that NT-proBNP is an important marker for the detection of heart failure and classification of disease severity in children. Thus, the compiled data set forms a solid data basis for long-term follow-up of a paediatric patient population with heart failure.

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IDENTIFICATION OF NIFURTIMOX METABOLITES IN URINE OF PEDIATRIC CHAGAS DISEASE PATIENTS BY UHPLC-MS/MS

CA Pérez Montilla, S Moroni, N González, G Moscatelli, JMJ Altcheh, F García Bournissen*. Multidisciplinary Institute for Research in Pediatric Pathologies (IMIPP-CONICET), Buenos Aires Children’s Hospital ‘Dr. Ricardo Gutiérrez’, Ciudad Autónoma de Buenos Aires, Argentina

Background Nifurtimox (NXF) is one of the only 2 available drugs for the treatment of Chagas disease, a parasitic disease endemic to Latin America. In spite of widespread use of this medication, little is known regarding its metabolism, particularly in children.

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