renally cleared drugs based on eGFR may not be reliable in this patient population.

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Disclosure(s) Nothing to disclose

P104

PHARMACOLOGIC DIFFERENCES OF ADALIMUMAB, INFlixIMAB AND ETANERCEPT: DO WE NEED SPECIFIC VACCINATION RECOMMENDATIONS FOR PRENATALLY EXPOSED INFANTS?

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10.1136/archdischild-2019-esdppp.142

Background In pregnancy adalimumab (ADA) and infliximab (IFX) should preferentially be stopped at gestational week 20 and etanercept (ETN) at weeks 30–32¹ because of their steadily increased transplacental transfer during the late second and third trimester. Pregnant women with chronic inflammatory diseases are often treated throughout their entire pregnancy to prevent negative impact on pregnancy outcomes from the disease. Therefore, more infants are born with prenatal exposure and the question arises if and when live vaccines can be administered safely.

Methods We reviewed pharmacologic properties of ADA, IFX and ETN with regards to prenatal exposure and vaccine recommendations.

Results IFX is a chimeric and ADA a human anti-TNF-alpha antibody. Both have high binding affinity to the neonatal Fc receptor (FcRn).² ETN is a TNF-alpha receptor fusion protein with a 5–10 fold lower binding affinity to the FcRn compared with IFX/ADA.²

At delivery neonatal drug concentrations compared with maternal ones seem to be higher in prenatally exposed infants to IFX^{3–5} (median ratio of 1.97) and ADA (median ratio of 1.21),³ whereas neonatal ETN concentrations are lower.^{6,7} The mean time to drug clearance in IFX or ADA exposed infants is 7.3 months and 4 months, respectively.³ Drug concentrations are undetectable for IFX or ADA after 12 and 9 months of life, respectively.³ In infants exposed throughout the entire pregnancy ETN is undetectable after 3 months.⁷

Infants exposed to ADA, IFX and ETN before gestational week 22 can follow the normal vaccination schedule including live vaccines,¹ whereas live vaccines in infants exposed in the late second and third trimester should be avoided for 6–12 months of life.^{1,3}

Conclusion Pharmacologic differences of ADA, ETN and IFX require specific live vaccine recommendations for infants exposed prenatally to these drugs.

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Disclosure(s) Nothing to disclose

P105

AMBULATORY STUDY CENTER AT THE UNIVERSITY OF BASEL CHILDREN'S HOSPITAL (UKBB)

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10.1136/archdischild-2019-esdppp.143

Background Many drugs authorized in Europe and the United States are inadequately studied in children. SwissPedNet Funding has boosted the development of specialized and professional pediatric centers for clinical studies in Switzerland tasked with executing compliant, reliable and family-centered clinical research. The University of Basel Children's Hospital (UKBB) is one of the pediatric clinical study centers.

Methods The Department for Clinical Research in Basel consists of the study center for adults at University Hospital Basel (USB) and the Ambulatory Study Center (ASZ) focusing on pediatric studies at the UKBB. The latter was established in 2015, and consists of a specialized team, including a medical director, medical coordinator, medical specialists in pediatrics as well as a team of study nurses.

The ASZ supports and promotes clinical studies with and for infants and children for external and internal sponsors in various therapeutic areas such as oncology, cardiology, pneumology, nephrology, neuropsychiatry, orthopaedics and infectious diseases. The full range of activities for executing the approved clinical study protocol can be offered, including planning, implementation, budgeting, coordinating, monitoring and archiving as well as collaboration with all required hospital departments.

Results Up to now, the ASZ has enrolled around 600 children in clinical trials, with 6 studies completed and 12 studies ongoing. A comprehensive Quality Management system was established and SOPs were jointly created with the adult study center. A digital clinical study request form is available for sponsors via the website.

Conclusion We see an increased demand for pediatric clinical studies across all age ranges and therapeutic areas. We envision a center of excellence with a pool of fully trained study nurses to accommodate and centrally organize all pediatric studies in the UKBB. Parent engagement and patient inclusion is one critical step to further improving healthcare for pediatric patients through highest quality clinical research.

Disclosure(s) Nothing to disclose

P106

IMPACT OF A COMPUTERISED PHYSICIAN ORDER ENTRY SYSTEM ON MEDICATION SAFETY IN PAEDIATRICS

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10.1136/archdischild-2019-esdppp.144

Background One of the most critical steps in the medication process on paediatric wards is the drug prescription.¹ Studies have shown that the use of electronic systems may improve the quality of prescribing and reduces medication errors in paediatric inpatients.²

This study aims to investigate the impact of a computerised physician order entry (CPOE) system (incl. decision support for dosing) on adverse drug reactions (ADR) and medication errors (ME) in comparison to paper-based prescribing and documentation.

Methods A prospective pre-post study was conducted at a general paediatric ward. All patients aged 17 years or younger that were treated for at least 24 hours during the study periods (5 months pre and post implementation) were observed. Adverse events were identified by intensive chart review.

The primary outcome measure was the incidence of clinically relevant ADRs and MEs. Events were assessed regarding causality (WHO), severity (WHO and additionally Dean & Barber for MEs) and preventability (Shumock).³

Results 338 patients with medication were included in the paper-based prescribing cohort (phase I) and 320 patients with medication in the electronic prescribing cohort (phase II). Median age was 7 (IQR 2 - 14) and 6 (IQR 1 - 13), respectively. In each cohort patients received a median number of 4 different drugs.

Potentially harmful MEs were less often observed in the cohort with electronic prescribing (n=231 vs. n=549). The mean number per patient significantly decreased from 1.62 to 0.72 (p< 0.05).

During the hospitalisation 2.1% (n=7) patients in phase I and 2.8% (n=9) in phase II experienced clinically relevant ADRs whereof two (0.6%) in each cohort originated from MEs.

Conclusion The implementation of a CPOE system significantly reduces medication errors, particularly those potentially harming patients but has less impact on ADRs.

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Disclosure(s) Nothing to disclose

P107

HOW SIGNIFICANT IS THE LACK OF FORMULATIONS FOR PAEDIATRIC INPATIENTS?

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10.1136/archdischild-2019-esdppp.145

Background Pharmacotherapy in children is complex requiring individual dosages of an active substance which are often not compatible with commercially available medicinal products.¹⁻² Manipulations of medicinal products, e.g. splitting or mortaring of tablets are common practice and often unavoidable although they entail risks for the patient as they can affect dosing accuracy, bioavailability and integrity of the dosage form.³⁻⁴

In this study we aim to determine how many medicines have to be manipulated before administration in a hospital setting in Germany.

Methods A prospective observational approach was used to determine all manipulations of drugs orally administered on two wards of a German children's hospital. A pharmacist systematically observed the nurses and documented all steps of the medication preparation processes for 7 days. Data was analysed using descriptive analysis. Types of manipulations were evaluated on the basis of the relevant summary of product characteristics (SmPC).

Results During the pilot phase 170 medication preparation processes were monitored. In 36,5% (n=62) of the observed processes medicines had to be manipulated. 54,3% (n=19) of the patients were affected by at least one manipulation. 48,4% (n=30) of all manipulations were unauthorized by the relevant SmPC affecting 37,1% of the patients. In 60,0% the reason for unauthorized manipulation was unsuitable strength of the available formulation. Dosage forms affected by unauthorized manipulations were tablets (n=28) and granules (n=2). Active substances most frequently involved in unauthorized manipulations were Omeprazole (n=11), Phenobarbital (n=7) and Topiramate (n=3).

Conclusion Overall, these results reveal that manipulations to medicines prior to administration are frequent on paediatric wards in Germany. About half of the manipulations are unauthorized indicating that no suitable paediatric formulation is available. Further investigation is needed to determine the preventability and the risks associated with the overall aim of improving safety of drug therapy in children.

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Disclosure(s) Nothing to disclose