



THE SIGNIFICANCE OF PHARMACY PREPARATION IN PAEDIATRICS

Making individual therapies for critically ill children possible

Background

Due to the fact that physical and metabolic processes are changing from birth into adulthood, children cannot be regarded as small adults when it comes to pharmacotherapy. This is why paediatric pharmacotherapy can be tricky. The paediatric doses of drugs are usually calculated individually according to age, weight and medical condition of the child. Many drugs are not available for paediatric use or in the desired formulation. Pharmacy compounded medicines can fill this gap.

Individually manufactured medicines

The 1000-bed Donauspital in Vienna provides all types of care for children, including a paediatric intensive care unit (PICU) and a neonatal intensive care unit (NICU). Pharmacotherapy in paediatrics is often limited due to the fact that no licensed medication is available for the condition of the child or – if available – the dosage is not right for age and/or developmental stage.

Therefore, individually manufactured medicines always play an important part in the therapy of children.

Since we had to assess the appropriateness of our allocation of human resources, we conducted this study to find out to what amount manufactured medicines are needed to treat our little patients.

How important is pharmaceutical compounding?

We investigated the extent of individually manufactured medications for children in our hospital to see if drug therapy in critically ill children can be successful without manufacturing in the pharmacy and to evaluate the significance of pharmacy production.

These medications include all kind of dosage forms, e.g. capsules, suppositories, i.v. preparations or compounded solutions for parenteral nutrition (TPN)



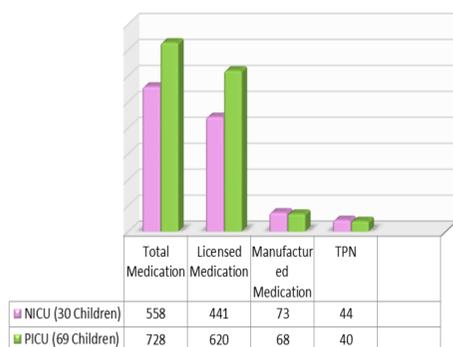
Material and methods

For three months (May to July 2019) all prescriptions for patients on PICU and NICU were recorded from the critical care information system of the hospital. We compared the number of the individually manufactured medications to the number of used drugs that were commercially available. All drugs were counted once per used dosage, even when prescribed several times for the same patient. We also counted TPN only once per patient (one solution containing amino acids, electrolytes and trace elements and one lipid emulsion containing vitamins), although the amount of the components prescribed changed almost daily.

Results

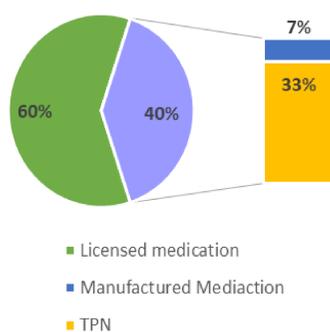
In our study period on both ICUs 99 children were hospitalized and treated with 1.286 medications, of which 225 were pharmacy manufactured (17,5%). We also produced 1.629 TPN units in these three months, 1.359 for the ICUs. Counting every single produced TPN bag for each kid, the percentage of pharmacy manufactured medicines reached 40% on PICU and 71% on NICU.

Comparison NICU and PICU



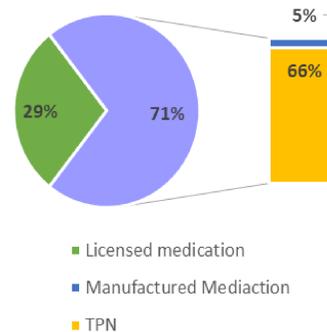
From May to July 2019 we produced 1.629 individual manufactured medicines for children on our paediatric wards.

PICU

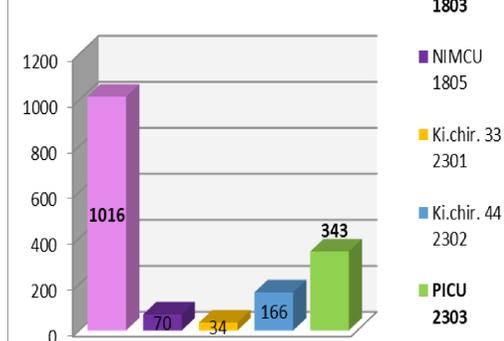


Medication on PICU and NICU counting every single TPN infusion bag for each kid.

NICU



TPN Production



From May to July we produced 1.629 TPN infusion bags for the paediatric Wards in our hospital.

Conclusion: individual pharmacy preparation in paediatrics is indispensable

A Pub-Med search found studies dealing with the problem of unlicensed or off-label drugs in children, but no data evaluating the amount that is pharmacy manufactured.

As we can show with our findings, individual pharmacy preparation in paediatrics is indispensable for the success of pharmacotherapy in critically ill children. It even makes conditions treatable that otherwise were not.

References:

Verdino B., Bedarfsorientierte Arzneimittel in der Pädiatrie – der Stellenwert der patientenindividuellen Herstellung im Donauspital Wien, Fachbereichsarbeit zur Erlangung des Titels „Fachapotheker für Krankenhauspharmazie“

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