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Off-label drug use, medication errors and adverse drug events – among Swedish pediatric inpatients

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av
Per Nydert
Apotekare

Huvudhandledare:
Professor Mikael Norman
Karolinska Institutet
Institutionen för klinisk vetenskap, intervention och teknik
Enheten för pediatrik

Bihandledare:
Docent Synnöve Lindemalm
Karolinska Institutet
Institutionen för klinisk vetenskap, intervention och teknik
Enheten för pediatrik

Fakultetsopponent:
Professor Boel Andersson Gäre
Jönköping University
Hälsohögskolan
Academy for Improvement of Health and Welfare

Betygsnämnd:
Professor Björn Wettermark
Uppsala Universitet
Institutionen för farmaci
Samhällsfarmaci och läkemedelsepidemiologi

Professor Nina Nelson Follin
Linköpings Universitet
Institutionen för biomedicinska och kliniska vetenskaper
Avdelningen för barns och kvinnors hälsa

Docent Jenny Kindblom
Göteborgs Universitet
Sahlgrenska Akademin
Institutionen för medicin

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ABSTRACT

Background: In pediatrics, treatment with drugs is an important and fully integrated part of everyday medical practice. However, authorized drugs specified to be used in children are often lacking which leads to off-label use, i.e. outside of approved product monographs. Another challenge is medication errors (ME) which is an important cause of adverse drug events (ADE) in hospitalized children. The consequences and effects of these conditions are largely unknown. Studies within the field of pediatric, and especially neonatal, drug safety are lacking. Unsafe drug use may be an important and unrecognized contributor to suboptimal health in this vulnerable group with limited capacity for drug metabolism and excretion.

Aim: The general aim of the thesis was to explore the magnitude of drug safety issues within Swedish pediatric inpatients. More specifically we aimed to investigate; I. National extent of off-label drug-use, II. Contents in national ME incident reports, III. Type of ADEs in a pediatric inpatient setting and IV. The views of pediatricians on a clinical decision support system (CDSS) to aid in prescribing drugs.

Methods: In the four papers we used different study approaches. In paper I we performed a descriptive cross-sectional study based on collection of drug charts during two time-points. In paper II we used an analytic cross-sectional register-based study on Lex Maria incident reports and complaints from the Health and Social Care Inspectorate. In paper III we carried out a cohort study using a chart review with a pediatric trigger tool covering 600 admissions stratified in four different units, and in paper IV we used qualitative semi-structured interviews with pediatricians.

Results: Paper I showed that half of all drug orders received by pediatric inpatients was outside approved product monographs, extemporaneously prepared or unlicensed. In paper II the ME reports indicated frequent occurrence of substances from three previously known high-alert lists with specified error characteristics among the different drug handling processes. In paper III we showed that skin/tissue/vascular harm, omission of analgesic drug therapy and hospital acquired infections are the most abundant ADEs as identified by an extended set of medical record triggers. In paper IV the CDSS-experiences of pediatricians emerged into six categories being: use, benefit, confidence, situations of disregards, misgivings/risks and development potential.

Conclusions: Paper I found a similar situation in Sweden regarding off-label and unlicensed drug use as in many other countries. Paper II found that the existing high-alert lists are relevant for pediatric inpatients and suggested the use of process dependent high-alert lists. Paper III found that ADEs are common in pediatric inpatients and that the incidence varied with ADE-type, depending on ward and time after admission. In paper IV the experiences of pediatricians after the implementation of a CDSS gave insights on usability and the need for future developments.

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