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Title : PREDICTORS FOR DRUG UTILIZATION AND DRUG RELATED PROBLEMS IN HOSPITALIZED NEONATES

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Despite complex pharmacotherapy management in neonates, the epidemiology of drug utilization, drug related problems (DRPs) and their predictors in hospitalized neonates in Malaysia are unknown. Thus, the aims of this study were to examine the drug utilization profile, DRPs and their predictors in hospitalized neonates. A systematic review was conducted prior to the actual study to determine the prescribing patterns and methodologies used for reporting drug utilization in hospitalized neonates. Two projects were undertaken under this study. Project I was conducted at Hospital Sultanah Aminah, Johor Bahru. Project I was carried out in Medical Record Office (retrospective) and neonatal intensive care unit (NICU) and neonatal wards (prospective). Patients' medication charts, ward notes and laboratory data were reviewed daily and progress of the selected patients in the ward were documented. Logistic regression was used to analyse potential risk factors associated with use of ≥ 5 drugs and DRPs occurrence. As Adverse Drug Reaction (ADR) is a subset of DRPs, Project II was carried out at National Pharmaceutical Regulatory Agency (NPRA) using the data from the national pharmacovigilance database, QUEST2 system to examine the characteristics and prevalence of ADRs in neonates in contrast to other paediatric population. The systematic review revealed that neonates are exposed to a high number of drugs, with antiinfectives for systemic use being the most predominantly prescribed. Various methods have been used to quantify drug consumption in neonates but no study from Malaysia was identified. In project I, a total of 302 neonates were included in the study. The majority of neonates admitted to NICU and neonatal wards were preterm (63.2%, n=191) and LBW infants (64.6%, n=195). On average, the neonates were admitted for 28.4 days and there were 2715 drugs documented. Antiinfectives for systemic use (n=1235, 45.5%) were the most commonly prescribed drugs, with benzylpenicillin (n=293) and gentamicin (n=275) being the most predominant. Number of diagnoses or problems was found to be a significant predictors for neonates to be prescribed with ≥ 5 drugs. In total, 768 DRPs were identified for 265 patients, whom had at least one DRP. The overall incidence of DRPs was 87.7% and treatment safety which relates to adverse drug events had the highest frequency amongst the reported problems, 67.1% (n=515). A retrospective analysis of ADRs reports received by the national pharmacovigilance centre in project II found that antibacterial for systemic use were commonly associated with ADRs in Malaysian children with majority of them manifested through skin reactions. ADRs reported for neonates was lower than other children age categories. Inappropriate dose, 60.0% (n=572) and drug selection 21.4% (n=204) were the common causes for DRPs identified. The number of drugs prescribed was the only potential risk factor that was found to be significant for the occurrence of DRPs. Neonates are exposed to high number of drugs and are at risk of developing DRPs. Pharmacists should set priority for the preterm and LBW neonates who have multiple diagnoses and prescribed with multiple drugs in order to minimize the risks of DRPs and subsequently improve efficiency of clinical pharmacy services.