

### Medication administration errors in Eastern Saudi Arabia

To the Editor

I have 3 comments on the interesting study by Sadat-Ali et al<sup>1</sup> on medication administration errors in Eastern Saudi Arabia.

First, Sadat-Ali et al's study<sup>1</sup> could be made more informative if the authors separately addressed the characteristics of medications errors (MEs) in children and adults. I presume that the authors were unable to do that because of limited number of MEs (n=39). Despite that limitation, the 36.9% of MEs in children reported by Sadat-Ali et al's study<sup>1</sup> is quite high and interesting. A recent British study addressed an overall prescribing error rate of 13.2% of medication orders. Incomplete prescriptions and dosing errors were the most common type of prescribing error. It also reported an overall incidence of 19.1% medication administration errors. Errors in drug preparation were the most common, followed by incorrect rates of intravenous administration.<sup>2</sup> Truly, both Sadat-Ali et al's<sup>1</sup> and Ghaleb et al's<sup>2</sup> studies pointed out that prescription, dose calculation, and administration of drugs to the pediatric age group pose a real challenge to the medical staff. It is not surprising to know that incorrect dose (10.5%) was the leading MEs in Sadat-Ali et al's<sup>1</sup> study as nowadays, 50-90% of drugs used in children have never been actually studied in this population. Consequently, either children are often exposed to the risk of adverse drug events or to lack of efficacy, or they are unable to benefit from many therapeutic advances offered to adults, as no clinical study has been properly performed in children. Actually, the main methods used to calculate the dose for a child are based on allometric methods taking into account different categories of age, body weight and/or the body surface area. Unfortunately, these calculation methods consider the children as small adults, which is not the case. Physiologically based pharmacokinetics is one way to integrate the physiological changes occurring in childhood, and to anticipate their impact on the pharmacokinetic processes: absorption, distribution, metabolism, and excretion/elimination.<sup>3</sup> Therefore, having a sound pharmacokinetic background of various medications is essential to minimize MEs.

Second, it is fundamental to determine the causes and the contributing factors to the MEs in hospitals. Actually, the main causes of MEs were found to be due to poor practices and inadequate knowledge, followed by problems of communication, packaging, and confusion over drug names. On the other hand, the main contributing factors were noticed to be due

to failure to follow rules and procedures, inadequate communication or training, interruptions and distractions, and drug storage on the wards.<sup>4</sup> A previous Saudi study involving 3963 MEs that was conducted over a 2 year period (2000-2002) showed that the most common causes identified for MEs in a descending order were human factor (46.5%), miscommunication (35%), and confusion (18.4%).<sup>5</sup> I wonder whether any changes have occurred in that pattern of contributing factors to MEs in Saudi Arabia. I presume that ascertaining that represents a worthy objective to be studied towards implementation of suitable educational programs to confront these factors.

Third, strikingly, 97.4% (37/38) of MEs in Sadat-Ali et al's study<sup>1</sup> were due to nurses, but only 2.6% (1/38) were due to physicians. Junior doctors who have recently graduated were found to be increasingly responsible for much of the prescribing errors that took place in hospitals and were implicated in many of the adverse medication events.<sup>6</sup> Poor prescribing is probably the most common cause of preventable MEs in hospitals, and many of these events involve junior doctors who have recently graduated. Prescribing is a complex skill that depends on a sound knowledge of medicines, an understanding of the principles of clinical pharmacology, the ability to make judgments concerning risks and benefits, and ideally experience. The challenge of being a prescriber is probably greater now than ever before. Medical education has changed radically in the last 20 years, reflecting concerns regarding an overburdened curriculum and lack of focus on social sciences. There has been growing concerns, not least from students, that medical school training is not sufficient to prepare them for the pressures of becoming prescribers. Knowledge and training are relevant factors in causation and that focused education improves prescribing performance.<sup>7</sup> It was also found that the introduction of the junior doctor prescribing tutorial decreased the prescribing errors by 46%. However, the introduction of a bedside prescribing guideline did not decrease the prescribing errors but may have been helpful to those doctors unable to attend a prescribing tutorial. By investing time and providing appropriate written resources, reduction in pediatric prescribing errors in the children's ward could be achieved by almost half.<sup>8</sup>

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#### Reply from the Author

We thank and appreciate the interest and comments raised by Prof. Al-Mendalawi regarding our article.<sup>1</sup> The

letter relates mostly to the comments on the subject rather than on the article itself except one issue. The objective of our study was to report and highlight the importance of MEs. The majority of the pediatric MEs were missed, and wrong dosage. Our incidence of MEs in children of 36.9% was similar to that reported by Hicks et al<sup>9</sup> of 34.6%.

Secondly, the causes of MEs as highlighted by Prof. Al-Mendalawi are well known and do not need any further clarification.

Thirdly, as nurses administer medications, hence, they become more vulnerable to cause errors and they are also responsible for intercepting 86% of all MEs.<sup>10</sup> In our settings junior doctors do prescribe medications, but do not administer to patients. The prescription of medications and the dosage is usually double checked by the pharmacist dispensing the medications. The administration of the drugs is the responsibility of the nurses, hence, they become liable to cause errors.

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