TEICOPLANIN: EVALUATION OF SERUM CONCENTRATIONS

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Aim The trust has implemented the use of therapeutic drug monitoring (TDM) of teicoplanin on intensive care following research that identified great variability in population pharmacokinetics in children.1–3 The summary of the research available showed that patients are not achieving target concentrations. This retrospective audit aimed to evaluate whether patients were achieving target serum concentrations. It also evaluated whether teicoplanin TDM was correctly completed for each patient. The following objectives were set based on grey literature and the Summary of Product Characteristics.4 Evaluate if serum concentrations are being taken on or after day 4 post initiation (steady state), and within 1 hour pre-dose (trough). Assess if serum concentrations reach target concentration with standard initial BNFC dosing appropriate for the indication of treatment.

Methods A retrospective report of teicoplanin serum concentrations was provided by the biochemistry labs covering a 6 month period. This report was used to identify the patients for the audit. For each patient: dose information, times and clinical particulars were obtained via the electronic prescribing system, Meditech version 6. If needed, clinical records were obtained from the medical records archive.

Results 71 serum concentrations were identified. 11 were excluded due to unobtainable or incomplete data. Serum concentrations were then evaluated for accuracy. The criteria set for determining accuracy were: Serum concentration taken on or after day 4 post initiation (steady state) Serum concentration taken within 1 hour pre-dose (trough) Patient prescribed correct BNFC dosing regimen 55% (n=33) of patients had all 3 criteria met for an accurate concentration to be determined. This meant 45% of our patients serum concentrations could not be used to accurately evaluate if current dosing regimens promptly achieve target concentrations. Using the patients' serum concentrations that followed the above criteria, it was found that 64% of these patients did not reach their desired target concentration. This included patients with: endocarditis (n=5) – aiming for trough greater than 30 mg/L cystic fibrosis (n=1) – aiming for trough greater than 20 mg/L other infections such as sepsis (n=27) – aiming for trough greater than 15 mg/L. No patient included in this audit that required a higher target concentration reached their target before the first serum concentration.

Conclusion It is evident that teicoplanin TDM, which is still in its infancy at the trust, requires further support to improve practice. From the serum concentrations that were carried out correctly, this audit begins to illustrate a number of issues surrounding teicoplanin dosing in paediatric patients, especially those with difficult to treat infections. Further research is required to assess how these correlate to clinical outcome in practice as well as evaluating patients not in an intensive care setting. This study can be a driving force for a larger scale study to be carried out so that recommendations can be established and a change of practice can be implemented.

REFERENCES
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AUDIT OF SODIUM BLOOD LEVELS IN PATIENTS ON PICU RECEIVING HEPARIN IN SODIUM CHLORIDE 0.9% COMPARED TO HEPARIN IN SODIUM CHLORIDE 0.45%

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Background On our paediatric intensive care unit (PICU), we have historically used heparin in 0.9% sodium chloride as a continuous flush to maintain patency of arterial and central venous pressure (CVP) central lines. Practice varies across the UK, some units use heparin in sodium chloride whilst others use sodium chloride alone to maintain line patency. Currently in paediatrics there is not enough evidence to change local practice by removing heparin from the flushes.1 A cost saving scheme was identified whereby using heparin in sodium chloride 0.45% was cheaper than using heparin in sodium chloride 0.9% (both products from Baxter). A proposal was put together and approved by the PICU quality improvement group, demonstrating that in theory, there should be no significant loss of sodium to patients due to the change in fluids. Although it may seem that flushes would not contribute a large proportion of a patient’s fluid requirement, in a typical 2.5 kg patient post cardiac surgery, 2 ml/hour would actually provide 40% of the patient’s total fluid allowance. This change in practice was implemented in June 2018.

Aim The aim of this audit was to establish whether patients receiving heparin in sodium chloride 0.45% had lower sodium blood levels or a greater drop in sodium levels than patients on heparin in sodium chloride 0.9%. We also evaluated whether a higher incidence of line blockage was reported in either group.

Methods Data was collected retrospectively using the Phillips ICCA electronic prescribing system, using 25 patients pre (April 2018) and 25 patients post (June and July 2018) implementation of the heparin in sodium chloride 0.45% flushes. Sodium blood gas levels were used as these were more consistently taken than plasma blood samples.

Results The data showed that heparin in sodium chloride 0.45% did not reduce sodium levels in patients. In each group 1 patient required additional sodium supplementation and 2 patients’ lines became blocked and therefore were removed. The average sodium on admission in the heparin in sodium chloride 0.9% group was 139.96 mmol/L (CI 95% ± 1.17 mmol/L) compared to the heparin in sodium chloride 0.45% group which was 135.68 mmol/L (CI 95% ± 1.91mmol/L). The average sodium level on either line removal or discharge from PICU was 138 mmol/L (CI 95% ± 1.35mmol/L) in the heparin sodium chloride 0.9% group compared to 135.72 mmol/L (CI 95% ± 1.88 mmol/L) in the heparin sodium chloride 0.45% group. The results indicated that patients within the pre-change group lost, on average, 2 mmol/L sodium compared to their admission sodium levels compared to 0.04 mmol/L in the post-change group. The reason for this
difference is unclear would warrant further investigation into alternative sources of sodium e.g. drug infusions and additional fluids which were outside of the scope of this audit.

Conclusion The change from using heparin in sodium chloride 0.9% to heparin in sodium chloride 0.45% was not found to lead to a reduction in plasma sodium levels in our patient population. Limitations to the audit include not considering alternative sources of sodium and a small patient population.

REFERENCE


P029 AUDIT OF ACICLOVIR PRESCRIBING TO ASSESS WHETHER CHANGING THE ORDER OF DROP DOWN BOX OPTIONS IN AN ELECTRONIC PRESCRIBING SYSTEM CAN REDUCE PRESCRIBING ERRORS

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Aim In December 2016 it was identified that there had been multiple reports of prescribing errors with intravenous aciclovir on the paediatric intensive care unit (PICU). After investigation it was concluded that prescribers choosing incorrectly from a drop down menu of drug and dosing options on the electronic prescribing (EP) system was the main contributory factor. From 01/02/17 the aciclovir drop down options were prioritised, with the most frequently used option appearing first, to encourage prescribers to pick the correct regimen.

Methods The trust has been using the Phillips ICCA EP system across all intensive care units since 2016. Picking errors when prescribing are known to be a potential risk within EP systems, however tailoring these systems to guide choice also has the potential to improve patient safety by reducing the risk of prescribing errors.1 Aciclovir has a complex range of dosing recommendations, especially in paediatrics, and incorrect prescribing increases the likelihood of subtherapeutic treatment or adverse effects. The aim of this audit is to assess whether changing the order of prescription choices on the drop down menu in the EP system reduced prescribing error rates for intravenous aciclovir. All prescriptions for aciclovir on PICU were included during the 6 months before and after implementing the change, from 01/08/16 to 31/07/17. 65 prescriptions were included in the audit and were reviewed retrospectively using the EP system and electronic medical notes to assess whether the prescribed aciclovir dose and route was correct for the patient’s age, weight and indication as well as whether the appropriate drop down option had been selected by the prescriber. Dosing was assessed against recommendations in the British National Formulary for children and trust empirical antibiotic guidelines.

Results Dosing errors were found in 22% (14/65) of prescriptions overall during the review period. Before the change was implemented 26% (9/35) of aciclovir prescription doses were incorrect, reducing to 17% (5/30) after the change. The overall dosing error rate was 14% (7/50) in prescriptions where the correct drop down option was chosen, in comparison to 47% (7/15) in cases where the wrong option had been selected, suggesting the importance of choosing the correct pre-set option to minimise prescribing error rates. In cases where doses were incorrect, the prescriber had chosen the incorrect pre-set drop down option for the patient’s age and indication in 78% (7/9) of prescriptions before the order change compared to 0% (0/5) afterwards.

Conclusion These results suggest that prescribing error rates were reduced after making alterations to the order of prescription choices on the drop down menu in the EP system and that prioritising the order of these options may positively influence prescribing. Errors were not completely eliminated suggesting more work is required to further minimise risk.

REFERENCE


P030 IMPROVING PATIENT EXPERIENCE BY IMPLEMENTING A NEW PATIENT PATHWAY TO OBTAIN METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS DECOLONISATION WITHIN THE PAEDIATRIC PRE-ASSESSMENT CLINIC

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Aim To improve patient experience, patient safety and streamline the patient journey when obtaining Methicillin-resistant well as unsafe due to interruption of healthcare professionals on the ward. To determine if this patient journey was a fair representation, questionnaires were distributed to parents/carers attending the pre-assessment clinic regarding the time taken at stages throughout the process and their satisfaction. These were distributed to every cardiac patient attending the clinic over a 4 week period (age 0–16 years). From the results it was concluded that the time could be reduced by patients obtaining MRSA decolonisation within the clinic; either by having a prescriber present or producing a Patient Group Directive (PGD). A PGD was preferred due to cost and workforce availability. A PGD was written, approved and implemented within clinic. To assess the reduction in time and change in patient experience, revised questionnaires are in the process of being distributed, again to every cardiac patient attending clinic over a 4 week period.

Results The initial patient journey took 130 minutes from beginning to end, with the time taken to obtain MRSA decolonisation being 80 minutes. 15 questionnaires were distributed, 9 patients responded (aged 6 months-14 years) with the mean time to obtain MRSA decolonisation being 59 minutes (40–85 minutes). From the 9 that responded, 5 of the comments sections regarding patient experience were left blank. 4 contained dissatisfied comments such as ‘very long afternoon with lots of walking’ and ‘seems silly to interrupt the very busy nurses and doctors for a prescription’. Post PGD 5 questionnaires have been distributed and 3 returned. Journey time has now been considerably reduced with an average time to obtain MRSA decolonisation being 5 minutes; a reduction of 54 minutes. Further responses are expected to support this.

Conclusion The patient experience when obtaining MRSA decolonisation prior to cardiac surgery was far from ideal. The implementation of a PGD has improved this experience and considerably reduced the time the process takes. This applies to all age ranges. A limitation is that only 3 questionnaires have been received post PGD implementation. The aim