INTRODUCTION

In Haiphong International Hospital, therapeutic drug monitoring (TDM) of amikacin has been implemented since 2019. Based on peak concentration (Cpeak, collected 30 minutes after the infusion) and trough concentration (Ctong, collected 2 hours or 30 minutes before the next dose), amikacin dosage will be adjusted by APK software. This study aimed to describe the characteristics and outcomes of applying this protocol of the hospital from 2019 to 2022.

METHODS

A retrospective data was collected from medical records of patients indicated with at least one TDM amikacin from 2019 to 2022 in Haiphong International Hospital. The blood concentrations of amikacin from patients were compared to Cpeak/Ctong target in the hospital’s protocol. The severity of acute kidney injury was classified according to the RIFLE criteria.

RESULTS

There were 204 patients indicated TDM amikacin from 2019 to 2022 in the hospital.

**Figure 1: Infectious diseases diagnosed**

Sepsis shock and sepsis were the most common infectious diseases indicated TDM amikacin.

In 204 patients, there were 193 (94.6%) using one daily dosing (ODD) and 11 (5.4%) using multiple daily dosing (MDD).

**Table 1. Characteristics of TDM amikacin**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Results</th>
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<tbody>
<tr>
<td>ODD (n =193)</td>
<td>MDD (n=11)</td>
</tr>
<tr>
<td>Initial dose (mg/kg) (Mean ± SD)</td>
<td>19.09 ± 5.21</td>
</tr>
<tr>
<td>Cpeak (mg/L), Mean ± SD</td>
<td>57.73 ± 5.24</td>
</tr>
<tr>
<td>Ctong (mg/L), Mean ± SD</td>
<td>1.65 ± 1.67</td>
</tr>
<tr>
<td>Number of TDM times per patient, Mean ± SD</td>
<td>2.94 ± 1.53</td>
</tr>
<tr>
<td>Patients indicated TDM 1 time (n, %)</td>
<td>111 (54.41)</td>
</tr>
<tr>
<td>Patients indicated TDM 2 times (n, %)</td>
<td>55 (26.96)</td>
</tr>
<tr>
<td>Patients indicated TDM 3 times (n, %)</td>
<td>7 (3.43)</td>
</tr>
<tr>
<td>Patients adjusted amikacin dosing (n, %)</td>
<td>68 (33.3%)</td>
</tr>
</tbody>
</table>

**Table 2. Patients achieving the TDM target**

<table>
<thead>
<tr>
<th></th>
<th>Cumulative quantity</th>
<th>Cumulative percentage, n = 204</th>
</tr>
</thead>
<tbody>
<tr>
<td>After first TDM</td>
<td>57</td>
<td>27.9%</td>
</tr>
<tr>
<td>After second TDM</td>
<td>88</td>
<td>34.1%</td>
</tr>
<tr>
<td>After third TDM</td>
<td>93</td>
<td>45.6%</td>
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Amikacin dose was adjusted on 68 patients (33.3%) and the proportion of patients achieving the target was increased from 27.9% to 45.6%. Of those with dose adjustment, 50 patients required second or third time of TDM indication.

Acute nephrotoxicity was observed on 8 (3.9%) patients and all Risk according to RIFLE. This rate was lower than the overall rate of 7.8% on all patients using in 2022.

CONCLUSION: TDM amikacin is an effective and safe clinical tool. The hospital should consider to implementing TDM amikacin as a routine practice.