INTRODUCTION

Pharmacists provide pharmaceutical care to morbidly obese and bariatric patients. This care is supported by practical guidelines for clinical decision support, which will pop up when medication is prescribed to a morbidly obese or a bariatric patient. These guidelines are a good start. However, pharmacists are able to optimise their care for both morbidly obese and bariatric patients, if they take into account several practical aspects.

AIMS

To describe practical aspects of pharmaceutical care for both morbidly obese and bariatric patients.

METHOD AND RESULTS

We searched for information on factors influencing safe and effective use of medicines in morbidly obese and bariatric patients. Based on this information, we described practical aspects of pharmaceutical care.

Examples:

1. Dosage checks which are automatically performed by the pharmacy information system may not be suitable for morbidly obese and bariatric patients. (figure 1)
2. After bariatric surgery, changes in gastric pH and in the gastrointestinal tract lead to changes in drug absorption (figure 2, 3 table 1).
3. Because of the changes in the gastrointestinal tract after a Roux and Y gastric bypass, oral sustained-release dosage forms may not be effective. (figure 3)
4. Due to a strict diet after bariatric surgery, medicines which need to be taken on an empty stomach, with a meal rich in fat or with a large amount of water may not be suitable.
5. Sugar as an excipient in liquid oral dosage forms could cause dumping syndrome in patients who have had a Roux and Y gastric bypass. If possible, sugar as an excipient should be avoided.
6. Estimated glomerular filtration rates to determine renal function should be interpreted with care:

Examples:

- For example in the Cockgroft Gault formula, body weight is considered a measure of muscle mass. This could lead to overestimation of the GFR in overweight individuals. When using this formula to estimate the GFR in morbidly obese patients, lean body weight should be used instead of total body weight.1,2,3
- Changes in gastric pH and the gastrointestinal tract lead to changes in drug absorption (figure 2, 3, table 1). Table 1: Changes after bariatric surgery possibly influencing pharmacokinetics

<table>
<thead>
<tr>
<th>CHANGE</th>
<th>Gastric sleeve</th>
<th>YGGB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smaller volume of distribution</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Increased gastric pH</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Reduced gastric mixing</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Gastric emptying</td>
<td>accelerated</td>
<td>delayed</td>
</tr>
<tr>
<td>Reduced surface area for absorption</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Reduced exposure to digestive enzymes</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Reduced exposure to metabolizing enzymes and drug transporters in the intestinal wall</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Reduced exposure to bile acids and altered enterohepatic recycling</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>Magnetic resonance transit time</td>
<td>√</td>
<td></td>
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</tbody>
</table>

Figure 1: Dosage check alert

Figure 2: Gastric sleeve

Figure 3: Roux- and Y gastric bypass

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CONCLUSIONS

We described several practical aspects which need to be taken into account to be able to provide tailored pharmaceutical care to morbidly obese and bariatric patients. These areas are a necessary addition to the practical guidelines for clinical decision support, which pop up when prescribing medicines to these patients.

Creating awareness among pharmacists and other healthcare professionals about the practical aspects we described is essential, as well as providing background information.