The Opioid Related Symptom Distress Scale (OR-SDS)
Background and Scoring

Background

The Opioid Related Symptom Distress Scale (OR-SDS) is a brief patient-reported outcome (PRO) measure of symptom distress due to the common adverse effects experienced by patients who receive opioids to relieve postoperative pain. It was developed with the intent of specifically measuring the clinical benefit of opioid-sparing treatment.

The OR-SDS is designed to be administered every 24 hours in the evening before bed, for the length of the clinical trial. In previous studies, the measure has been administered over the telephone on certain days via Interactive Voice Response System (IVRS) (i.e. directly after surgery) and collected via patient diary (paper form) on other days. The specific method of data collection may vary depending upon the study design. However, content validity testing as well as validation of scoring of the instrument has been conducted using a pen-paper diary version of the measure.

The OR-SDS was adapted from the Memorial Symptom Assessment Scale (MSAS), a validated measure for evaluating symptom frequency, severity and distress (Portenoy et al., 1994; Chang et al., 2004). As the MSAS was developed for cancer pain, the items were revised to include symptoms specific to opioid-related distress. This was done based on literature and expert review of adverse effects associated with opioid analgesia. Items which could not be assessed by patient self-report (e.g. respiratory depression) were removed. This resulted in 12 symptoms which were used in the original version of the OR-SDS.

Initial validation of the 12 item OR-SDS was based on data from Day 1 of a clinical trial containing 193 patients who required elective ambulatory laparoscopic cholecystectomy surgery (Apfelbaum et al., 2004). Studies such as this have demonstrated that it has excellent psychometric properties including strong internal consistency, clinical and known groups validity, and sensitivity to change.

Subsequent studies have resulted in further instrument development including the removal of a couple of items, resulting in a final 10 item OR-SDS. The symptoms dry mouth and headache were removed as they are not specific to opioid treatment and their prevalence was below 5% (Zhao et al., 2004).

The final version of the OR-SDS assesses patient-reported levels of frequency, severity, and bothersomeness of 10 symptoms associated with opioid medication usage: fatigue, drowsiness, inability to concentrate, confusion, nausea, dizziness, constipation, itching, difficulty with urination, and retching/vomiting. To aid interpretation, determination of what constitutes a clinically meaningful event (CME) for each symptom is provided in this scoring manual.

The final version of the OR-SDS has been validated in two randomized clinical trials: a general surgery trial and a coronary artery bypass graft surgery trial. These studies found a significant positive association between CMEs scores (as defined by the OR-
SDS), daily opioid consumption and cumulative opioid consumption (Chan et al., 2009). These findings provide evidence for the construct validity of the composite CME scores, suggesting that the OR-SDS is appropriate for evaluating patients’ opioid-related symptom distress.
Scoring for the OR-SDS

The OR-SDS contains 10 opioid-related symptoms: Fatigue, drowsiness, inability to concentrate, confusion, nausea, dizziness, constipation, itching, difficulty with urination, retching/vomiting (Appendix A).

Firstly, patients are asked “During the last 24 hours, did you experience any of the following”, followed by the list of symptoms. If the symptom was absent during that period they mark an ‘X’ in the box ‘did not have’ next to that symptom. If the symptom was present then they answer 3 questions assessing the frequency, severity and bother of the symptom.

Clinically Meaningful Events (CMEs)

Defining CMEs

Although the OR-SDS is a valid measure of opioid-related side effects, it can be difficult to interpret its scores in a way that is clinically meaningful. In order to aid interpretation, a system of CME scoring has been established for the OR-SDS.

Development of CMEs

CMEs define how bothersome a symptom is. In an earlier study (Given, 2008) bother was defined as a response of “quite a bit” or “severe” on the bother item of the OR-SDS. Chan (2009) took this definition and used receiver-operating characteristic (ROC) curves to determine which cut-offs on the symptom frequency and severity scales best distinguished between those patients who were bothered by a symptom and those who were not. The ROC curves showed that the cut-off points on the scale for symptom severity best made this distinction and that this was not improved by the addition of frequency (Chan, 2009). Thus, the CMEs are calculated using responses to the symptom severity questions only. The frequency and bother scales may independently provide further descriptive information about potential side effects experienced by the patients.

Calculating CMEs

The CMEs are calculated using responses to the symptom severity questions only.

For each symptom, severity is assessed by the question: “(If yes), how severe was it usually?” (In the past 24 hours)

The responses to the severity questions are measured on a 5-point scale from 0-4 in ascending order as follows:

- Did not have symptom (0)
- Slight (1)
- Moderate (2)
- Severe (3)
- Very severe (4)
To determine if a symptom has met the criteria for a CME the following cut-offs should be used:

For all symptoms except confusion, a CME is defined as scoring ‘severe’ or ‘very severe’ (i.e. >2) on the severity scale for each of those symptoms. For example, itching would be classified as a CME if patients give it a score of 3 or more on the severity scale.

For the confusion symptom, a CME is defined as scoring ‘moderate’, ‘severe’ or ‘very severe’ (i.e. >1) on the severity scale for that symptom. Thus, confusion is classified as a CME if patients give it a score of 2 or more on the severity scale.

**Composite CME scores**

The total number of CMEs experienced in a 24 hour period is calculated by summing the number of CMEs across all symptoms for that period. This is called the daily CME score. An exception to this rule is nausea and retching/vomiting, where only a single CME should be generated even if a CME for both symptoms are observed. This is because the results of factor analysis and clinical assessment suggested that they are manifestations of the same underlying symptom. Therefore, in a 24 hour period a patient can experience up to 9 daily CMEs.

The total number of CMEs experienced over a longer time period is calculated by summing the number of daily CME scores over that period.

**Missing data/Incorrect Completion**

In order to minimise the amount of missing data and incorrect completion, patients should be given clear instructions on how to complete the questionnaire. Firstly, they should be instructed to complete all of the items and to respond to the questions about frequency, severity, and level of bother for each symptom they have experienced. They should also be asked to complete the OR-SDS in the evening before bed to allow them to reflect on the whole day. Finally, as this is a daily diary, patients should be asked to reflect on the previous 24 hours only. Missing responses on an entire symptom should be treated as missing data and should not be backfilled.

Chan et al. (2009) employed pair-wise deletion techniques for missing data. For example, if a patient was missing all OR-SDS data on any given day, their CME score was missing for that day. If data for any severity ratings of side effects experienced were missing on a given day, their CME score was missing for that day. Given the low level of missing data in this study, they did not impute missing values.

**Procedure**

An updated procedure for dealing with missing and incomplete data is to be developed and validated using the results of an ongoing study. However, the procedure outlined below may be used as guidance for how this can be done, although it is important to consider that this method has not been validated.
Given the way the CME scoring was developed and the high correlations between the severity and frequency response scales, it may be appropriate to use a frequency response to calculate a CME if a response on the severity response scale is missing (Chan et al. 2009). In this case, the items would be coded as follows:

- Did not have symptom (0)
- Rarely (1)
- Occasionally (2)
- Frequently (3)
- Almost constantly (4)

For all symptoms except confusion, a CME could be defined as scoring ‘Frequently’ or ‘Almost Constantly’ (i.e. >2) on the frequency scale for each of those symptoms.

For the confusion symptom, a CME could be defined as scoring ‘Occasionally’, ‘Frequently’ or ‘Almost constantly’ (i.e. >1) on the frequency scale for that symptom. Therefore confusion would be classified as a CME if patients gave it a score of 2 or more on the frequency scale.

References


Appendix A: The Opioid-Related Symptom Distress Scale (OR-SDS)

We have listed 10 symptoms below. Read each one carefully. If you have had the symptom during the past 24 hours, let us know how OFTEN you had it, how SEVERE it was usually and how much it DISTRESSED OR BOTHERED you by placing an “X” in the appropriate box. If you DID NOT HAVE the symptoms, please place an “X” in the box marked “Did not have.”

For the symptoms “retching/vomiting” below, you will indicate the actual number of episodes you experienced.

During the last 24 hours, did you have any of the following:

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Did not have</th>
<th>(If yes), how often did you have it?</th>
<th>(If yes), how severe was it usually?</th>
<th>(If yes), how much did it distress or bother you?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Rarely</td>
<td>Occasionally</td>
<td>Frequently</td>
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<tr>
<td>Fatigue</td>
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<td>Drowsiness</td>
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<td>Inability to concentrate</td>
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<td>Nausea</td>
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<td>Dizziness</td>
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<td>Constipation</td>
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<tr>
<td>Condition</td>
<td># of Episodes</td>
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<tr>
<td>Itching</td>
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<td>Difficulty with urination</td>
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<tr>
<td>Confusion</td>
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<tr>
<td>Retching/vomiting</td>
<td>_ _ # of episodes</td>
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