Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

CRD summary
This study examined the cost-effectiveness of tapentadol, compared with opioids that were commonly used, as a first treatment for severe, chronic, non-malignant pain. The authors concluded that tapentadol was likely to be the best initial treatment for severe chronic non-malignant pain, in Spain. All the model assumptions were reported and key areas of uncertainty were investigated. The authors' conclusions appear to be robust.

Type of economic evaluation
Cost-utility analysis

Study objective
This study examined the cost-effectiveness of tapentadol, compared with opioids that were commonly used, as a first treatment for severe, chronic, non-malignant pain.

Interventions
Tapentadol 240mg daily was compared with oxycodone 40mg daily, morphine 80mg daily, or transdermal fentanyl 0.8mg daily.

Location/setting
Spain/primary care.

Methods
Analytical approach:
The analysis was based on a Markov state-transition model, with a one-year time horizon. The authors stated that they took the perspective of the health care payer.

Effectiveness data:
A review was performed in MEDLINE to identify published randomised, placebo-controlled trials of opioids for the treatment of chronic low back pain or osteoarthritis. The data for tapentadol versus oxycodone were from a head-to-head randomised controlled trial, over 15 weeks. The data for morphine and fentanyl were from a published open-label trial. Some assumptions were required to extrapolate the clinical inputs beyond the trial period. Data that were not found in the literature were from a two-round Delphi panel of seven physicians with experience in treating patients with pain. A key input was the rate at which patients switched to a second-line treatment because of adverse events, especially gastrointestinal events (severe constipation, nausea, or vomiting).

Monetary benefit and utility valuations:
The utility values were from the tapentadol trial, which collected European Quality of life (EQ-5D) scores. Similar estimates were used for all the drugs. Some assumptions were required.

Measure of benefit:
Quality-adjusted life-years (QALYs) were the summary benefit measure.

Cost data:
The economic analysis included the costs of medications, physician visits, and hospitalisations, for both the treatment of
pain and the management of adverse events. The drug costs were based on their average public prices, using market shares; the price of tapentadol was assumed, as it had not been launched in Spain at the time of the study. The average reimbursement rate depended on the age of the patient (older or younger than 65 years) and the prescribed opioid. Total daily doses were based on evidence from the trials. Different costs were assumed for the titration and maintenance phases. The costs of other health care resources were from official prices. The patterns of resource consumption were from the Delphi panel. All costs were in Euros (EUR).

Analysis of uncertainty:
A probabilistic sensitivity analysis was performed, by assigning distributions to sets of model inputs on the basis of their standard errors. One-way sensitivity analyses were carried out, using ranges of values defined by the authors. Alternative approaches were used to extrapolate the data beyond the four-week follow-up in the trials.

Results
Expected one-year costs were EUR 1,884.46 with tapentadol, EUR 1,928.65 with oxycodone, EUR 1,837.58 with morphine, and EUR 1,845.48 with fentanyl. The QALYs were 0.6298 with tapentadol, 0.6095 with oxycodone, 0.6122 with morphine, and 0.6110 with fentanyl.

The incremental analysis showed that tapentadol was dominant over oxycodone, which had higher costs and fewer QALYs. The incremental cost per QALY gained with tapentadol was EUR 2,656 over morphine and EUR 2,069 over fentanyl. Both figures were well below the usual cost-effectiveness threshold of EUR 20,000 per QALY gained.

The sensitivity analysis confirmed that the findings were generally robust. The probabilistic sensitivity analysis showed that tapentadol was the preferred strategy in more than 90% of simulations at thresholds of EUR 20,000 or EUR 30,000 per QALY gained. The one-way sensitivity analyses indicated that the incremental cost-utility ratio of tapentadol versus the comparators varied from dominant to EUR 18,506 (versus morphine). Most of the ratios were below EUR 10,000 per QALY gained.

Authors’ conclusions
The authors concluded that tapentadol was likely to be the best initial treatment for severe chronic non-malignant pain, in Spain.

CRD commentary
Interventions:
The selection of the comparators was appropriate as the available medications for patients with severe pain were considered.

Effectiveness/benefits:
The clinical data for tapentadol and oxycodone were from a head-to-head trial, which should have had high internal validity. The estimates for the other drugs were from an open-label trial, with similar patients. A Delphi panel was used for some other data and these parameters were extensively tested in the sensitivity analysis. The use of QALYs was appropriate for patients in pain, as this can have a big impact on quality of life. The utility weights were appropriately from patients enrolled in the trial that compared tapentadol and oxycodone.

Costs:
The economic analysis was satisfactorily carried out. The cost categories and the sources for the costs were consistent with the economic viewpoint of the public health system. All the assumptions for the drug costs were explicitly reported. Appropriate costs were used and the patterns of resource consumption reflected the Spanish setting. Extensive details of the unit costs and quantities of resources were reported for all items, enhancing the transparency of the analysis. The price year was explicitly stated, which will allow reflation exercises. Alternative cost assumptions were assessed in the sensitivity analyses.

Analysis and results:
The results were clearly presented. An incremental approach was used to combine the costs and benefits of tapentadol versus each of the comparators. A simple diagram of the decision model was given. The authors pointed out that the main focus of their model was the tolerability of treatment, due to the better safety profile of tapentadol compared with...
other treatments. Both deterministic and probabilistic analyses were carried out to investigate uncertainty and the methods and results were clearly reported. The authors compared their study with other published economic evaluations, which had many similarities. Some limitations were acknowledged, such as the need for assumptions and possible bias in some clinical data, but it appears that these were addressed in the sensitivity analysis. The findings might be transferable to other settings with similar relative drug prices.

Concluding remarks:
All the model assumptions were reported and key areas of uncertainty were investigated. The authors' conclusions appear to be robust.

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