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Cost-effectiveness of mirogabalin for the treatment of post-herpetic neuralgia in Taiwan

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ABSTRACT

Objectives: To assess the cost-effectiveness of mirogabalin versus no treatment or pregabalin in patients with post-herpetic neuralgia (PHN) from a third-party perspective in Taiwan.

Methods: A Markov model, which was developed with 2-week cycles and 1-year time horizon from the Taiwanese National Health Insurance Administration perspective, consisted of three health states: “mild,” “moderate,” and “severe” pain. Average daily pain score (ADPS) was assessed at the end of each cycle. Patients either remained in, or transitioned from, their assigned health state to a different state according to their pain score changes. All patients entered the model in “moderate” (4 ≤ ADPS < 7) or “severe” (7 ≤ ADPS ≤ 10) pain health states. Efficacy data was informed by the pivotal Phase III trial, or by a network meta-analysis (NMA). Utility values were obtained from published literature and cost data from Taiwanese clinical experts and the Taiwan National Health Insurance Administration, using 2018 New Taiwan dollar (NT$). Probabilistic analysis was conducted to test the robustness of base case results.

Results: Head-to-head analysis showed mirogabalin 30 mg to be cost-effective versus placebo in PHN. The deterministic analysis estimated a quality-adjusted life years gain of 0.041 at an ICER of NT$11,231 (US$365) versus no treatment (ICER: NT$274,567 [US$8,900]). In the NMAs, mirogabalin was cost-effective compared to pregabalin 150 mg (ICER: NT$515,881 [US$16,720]) and 300 mg (ICER: NT$201,671 [US$6,535]). Mirogabalin 30 mg dominated pregabalin 600 mg. Results from sensitivity and scenario analyses confirmed these results.

Conclusion: Mirogabalin 30 mg, a potent and selective α2δ ligand, is a cost-effective treatment option for PHN in Taiwan, with ICERs below the willingness-to-pay threshold.

INTRODUCTION

Herpes Zoster (HZ), also known as shingles, is the reactivation of varicella zoster virus that remains dormant in the dorsal root ganglia for decades after patient’s initial exposure to the virus (as chickenpox). The most common chronic complication of HZ is post-herpetic neuralgia (PHN), with the potential to significantly affect one’s quality of life, activity, mood and sleep. This complication is defined as neuropathic pain that persists for three or more months after the onset of HZ rash in the same affected area.

Prevalence of PHN among HZ patients is estimated to vary between 5% and 30% across the globe. The frequency and severity of PHN increase with advancing age, and with subsequent increase in global life expectancy, the overall disease burden is expected to increase even further. The local burden of PHN in Taiwan, as inferred by a retrospective cohort study, is reported to be 8.6% among patients diagnosed with HZ.

The pathophysiology involves disturbances within the central and peripheral nervous systems. It is thought to be due to nerve damage caused by activation of the dormant virus during the shingles episode, and its replication and propagation along the affected nerve in the dermatomal area of the skin. This eventually triggers an inflammatory immune response capable of damaging central and peripheral neurons by sending abnormal electrical signals to the brain. These signals convey sharp excruciating pain, and may persist or recur for months, years, or even for life.

The management of PHN is challenging, involving medications to alleviate pain. Clinical practice guidelines have been published by international and regional professional associations and there is broad agreement among guidelines on pharmacological treatment of neuropathic pain. Treatment guidelines are available for some Asian countries (e.g. Japan and Korea), however, there are no country-specific treatment guidelines for Taiwan. In 2018, payers and key opinion leaders were interviewed in Japan, Taiwan and...
South Korea which included discussions about the current treatment landscape and payer management approach. The outcome of the interviews showed consistency with the treatment guidelines for first-line treatment. First line drugs include anticonvulsants like pregabalin and gabapentin for pain relief, and antidepressants, especially those that act to inhibit the reuptake of serotonin and noradrenaline (e.g. duloxetine). Some experimental and clinical evidence favors the use of opioids for pain control, mainly if associated with first line drugs. Also, for PHN, topical agents such as lidocaine patches or capsaicin lotion can be used. PHN is perceived as a therapeutic challenge since relief from the pain is still unsatisfactory, limited by anticholinergic side effects and by the development of tolerance.

The efficacy of mirogabalin besilate (Tarlige), a potent and selective \( \alpha_2\delta \) ligand for the management of PHN, was established in a 14-week randomized, double-blind placebo-controlled phase 3 trial (J304, NCT02318719) conducted in an Asian patient population, followed by a 1-year open label extension design. The trial demonstrated a statistically significant reduction in weekly average daily pain score (ADPS) between baseline and Week 14 as the primary efficacy endpoint.

In the current healthcare environment, value for money is becoming an increasingly important criterion to assess new treatments. Thus, the aim of this study was to develop an economic model to assess the cost utility of mirogabalin 30 mg for the treatment of PHN from a third-party perspective in a Taiwanese population.

**Methods**

**Model structure and flow**

The population included in the model was Asian patients with PHN. The primary efficacy endpoint was assessed by a statistically significant reduction in weekly ADPS between baseline and Week 14. A Markov cohort model was developed in Microsoft Excel 2013 to estimate the costs and outcomes of using mirogabalin 30 mg for the treatment of patients with PHN. Our model compared mirogabalin 30 mg with the study comparators, pregabalin 150 mg, 300 mg, 600 mg, and placebo. The Markov model applied cycles of 2 weeks and the time horizon was 1 year. Given that the trial period was short, at 14-weeks, a 2-week cycle was considered appropriate to accurately capture the changes in ADPS and calculate transition probabilities.

The model consists of three health states: “mild,” “moderate,” and “severe” pain. The definition of these health states is based upon the pain scores reported by patients using an 11-point scale (0 to 10, with 10 corresponding to maximum pain and 0 to no pain). A pain score <4 (i.e. 0 to 3) is considered mild pain, ≥4 and <7 is moderate pain and ≥7 to ≤10 is severe pain. Mortality is not specified in this model given the short time horizon. A schematic diagram of the model is illustrated in Figure 1. The base case was from the perspective of the National Health Insurance Administration in Taiwan according to the guidelines for economic evaluation of drugs in Taiwan.

**Model inputs**

**Efficacy**

The transition probabilities for mirogabalin and no treatment (placebo) and the transition probabilities for mirogabalin and active pregabalin treatments were informed from the head-to-head comparison (mirogabalin) versus placebo trial data (J304) and a network meta-analysis (NMA), respectively. For the head-to-head comparison versus placebo, the mean ADPS change every 2 weeks as observed in the J304 head-to-head trial (Supporting Information Table S1 [Appendix]) was used to estimate the health state transition probability for the first 14 weeks. The J304 study was conducted in Asian countries wherein 3.3% were Taiwanese, however, we assumed the patient population characteristics will reflect those of the overall patient population in Taiwan.

For comparisons versus active treatments, the transition probabilities for mirogabalin and active treatments (pregabalin 150 mg, 300 mg, and 600 mg) were calculated using the point estimate (i.e. mean difference in ADPS relative to mirogabalin 30 mg from week 0 to week 14) reported in the NMA (data on file). Studies included in the NMA were limited to those where the population was 100% Asian (i.e. mixed populations were excluded). A statistically significant mean difference in the mean change in ADPS was reported in the comparison of mirogabalin 30 mg versus placebo (−0.77 [−1.1 to −0.44]), while no significant difference was observed for the comparison of mirogabalin 30 mg versus pregabalin.
150 mg (–0.46 [–1.09 to 0.17]), pregabalin 300 mg (–0.01 [–0.46 to 0.44]), and pregabalin 600 mg (–0.14 [–0.76 to 0.48]).

An average ADPS value at baseline was selected for a reference treatment (e.g. mirogabalin 30 mg) and the mean difference from baseline to the endpoint (e.g. week 14) was applied. This treatment subsequently acted as the "anchor" treatment to which the mean difference of differences reported in the NMA was applied to generate the change in ADPS from baseline to the treatment endpoint (and subsequently calculate the ADPS at the endpoint) for each comparator. To apply this mean difference across each model cycle, a proportion of the change in ADPS was applied in each model cycle up to week 14. The proportion by which the change in ADPS was distributed across cycles was based on the mean change in ADPS that occurred every 2 weeks in J304 study.

Withdrawal due to adverse events
The probability of withdrawal due to adverse events (WDAE) at week 14 was calculated using the treatment discontinuations due to treatment-emergent adverse events reported in J304 study (Supporting Information Table S2 [Appendix]). This data was used to determine the number of patients remaining on treatment by calculating the probability of WDAE at week 14 and, subsequently, the probability of WDAE every 2 weeks in order to distribute the transition probability across model cycles. For this, it was assumed that the WDAE is constant across model cycles.

In addition to the ADPS outcome, the NMA also explored the relative risk (RR) of WDAE. The RR of WDAE was applied to the distribution of patients in each health state to determine the total number of patients remaining on treatment. The RR of WDAE reported as per the NMA were 1.08 (0.27 to 3.58) for placebo, 0.7 (0.12 to 3.59) for pregabalin 150 mg, and severe pain (0.2) health states relate to a mixed population of patients with both PHN and diabetic peripheral neuropathic pain was derived from Tarride et al.20 and applied in the model. Utility values for a PHN population, exclusively, were not available.

Cost and resource utilization
The PLR and discussion with two clinical experts identified the resources relating to PHN that were included in the model. The resources captured in the model comprised of drug acquisition costs, medical staff visits (primary care, physician visits, pain specialist, dermatologist, endocrinologist, neurologist), radiological tests and procedures (nerve conduction, quantitative sensory exploration, electromyogram) and laboratory tests (full blood count, biochemical profile, urinalysis). The monitoring frequency per year for each health state (annual health care resource utilization for each health state) as estimated by the two clinical experts is outlined in Supporting Information Table S3 (Appendix). The resource utilization costs were obtained from the National Health Insurance Administration, Ministry of Health and Welfare21 in Taiwan outlined in Supporting Information Table S4 (Appendix).

Analysis
Base case
A cost-utility analysis was performed which focused on the quality-adjusted life years (QALYs) among patients with PHN who were treated with mirogabalin 30 mg versus relevant comparators in Taiwan. The incremental cost and incremental health improvement measured in QALYs were combined to determine the incremental cost-utility ratio between the treatment arms. The base case analysis modeled for costs (treatment costs, monitoring costs, and incremental costs), QALYs (total and incremental), and incremental cost-effectiveness ratios (incremental cost per QALY gained).

One-way sensitivity analysis
One-way sensitivity analysis (OWSA) were conducted to test the robustness of the base case results. Key model inputs were varied, one parameter at a time, and the resulting impact on the ICER was recorded and ranked in order of magnitude of impact. Parameters that were considered likely to impact the model outputs were selected for variation and are presented in Supporting Information Table S5 (Appendix). The input parameters were varied by ±20%, with the exception of drug costs, which were varied by ±5%.

Scenario analysis
The model also allows for the exploration of methodological or structural uncertainty via scenario analysis which can also be incorporated into the OWSA. Utility data sources and the NMA efficacy data were changed to assess the impact of these parameters on the costs and QALYs. The alternative utility values were adopted from Rodriguez et al.22. The alternative efficacy data from the PHN random effects (RE) NMA
(vague priors) and RE NMA (informative priors) are presented in Supporting Information Table S6 and Table S7 (Appendix).

Probabilistic sensitivity analysis

In probabilistic sensitivity analysis (PSA), all parameters were varied simultaneously to further explore the universe of possible model outcomes. The model made use of predefined ranges around the mean values either based on standard errors sourced from primary sources or by applying a user defined variation to generate random inputs that follow appropriate sampling distributions. This exercise, in which the new parameter values drawn from their respective distributions lead to a certain model outcome, was repeated 2,000 times to create an estimate with an acceptable degree of precision. The results of the PSA (i.e. Monte Carlo simulation) were plotted in cost-effectiveness planes to visualize the distribution of possible ICERs relative to the selected comparator. Cost-effectiveness acceptability curves (CEAC) were produced to summarize the impact of uncertainty on the ICER in relation to possible values of the cost-effectiveness threshold. For the disease monitoring cost (i.e. medical staff, laboratory etc.), a normal approximation of a gamma distribution was applied. Unit drug costs were not varied in the probabilistic analysis. For utilities values, a beta distribution was used to sample appropriate values.

Results

Head-to-head base case

The head-to-head base-case deterministic analysis demonstrated that mirogabalin 30 mg (intervention) is associated with an incremental QALY of 0.041 over the 1-year time horizon, at an incremental cost of NT$201,671 (US$6,453). When compared to pregabalin 600 mg, mirogabalin 30 mg is dominant (incremental QALY of 0.025, at an incremental cost of NT$2,326 (US$74)). The ICER amounts to NT$201,671 (US$6,453). When compared to pregabalin 300 mg, mirogabalin 30 mg is associated with an incremental QALY of 0.012, at an incremental cost of NT$2,326 (US$74). The ICER amounts to NT$201,671 (US$6,453). When compared to pregabalin 150 mg, mirogabalin 30 mg is associated with an incremental QALY of 0.041, at an incremental cost of NT$2,326 (US$74). The ICER amounts to NT$201,671 (US$6,453). When compared to placebo, mirogabalin 30 mg is associated with an incremental QALY of 0.012, at an incremental cost of NT$2,326 (US$74). The ICER amounts to NT$201,671 (US$6,453).

In this analysis, using data from J304 study for mirogabalin 30 mg versus placebo, the key model drivers were:

- Utility value for mild pain
- Source of utility scores derived from Rodriguez et al.
- Utility value for moderate pain

Scenario analysis was conducted to demonstrate that the model is robust to changes in the parameters presented in Table 2. When using the source of utility scores derived from Rodriguez et al., the ICER was NT$388,000 (US$12,000). Alternatively, when the utility values for the key model drivers for mild and moderate pain are varied by ±20%, the ICERs are NT$440,000 (US$14,000) and NT$245,000 (US$8,000), respectively. When the utility values for mild and moderate pain are varied by ±20%, the ICERs are NT$200,000 (US$6,000) and NT$313,000 (US$10,000), respectively. Despite varying the input parameters by ±20%, mirogabalin 30 mg remains cost-effective with an ICER below NT$1,750,000 (US$56,000), the approximate WTP threshold in Taiwan (2.5 times GDP).

NMA base case

Mirogabalin 30 mg is associated with an incremental QALY of 0.021, at an incremental cost of NT$10,630 (US$340) versus pregabalin 150 mg. The ICER amounts to NT$15,881 (US$16,508). For comparison versus pregabalin 300 mg, mirogabalin 30 mg is associated with an incremental QALY of 0.012, at an incremental cost of NT$2,326 (US$74). The ICER amounts to NT$201,671 (US$6,453). When compared to pregabalin 600 mg, mirogabalin 30 mg is dominant (incremental QALY of 0.025, at an incremental cost of –NT$11,797 (–US$378)). The deterministic results are summarized in Table 1.

The key model drivers included in the OWSA analysis for mirogabalin 30 mg versus placebo, pregabalin 150 mg, pregabalin 300 mg and pregabalin 600 mg, head-to-head, and NMA deterministic analysis (J304).

<table>
<thead>
<tr>
<th>Mirogabalin 30 mg</th>
<th>Placebo</th>
<th>Pregabalin 150 mg</th>
<th>Pregabalin 300 mg</th>
<th>Pregabalin 600 mg</th>
<th>Incremental</th>
<th>ICER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head-to-head</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total costs</td>
<td>NT$38,907.02 (US$1,245)</td>
<td>NT$27,676.06 (US$886)</td>
<td></td>
<td></td>
<td>NT$11,230.96 (US$359)</td>
<td>NT$274,567 (US$8,786)</td>
</tr>
<tr>
<td>QALYs</td>
<td>0.575</td>
<td>0.534</td>
<td></td>
<td></td>
<td>0.041</td>
<td></td>
</tr>
<tr>
<td>NMA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total costs</td>
<td>NT$38,907.02 (US$1,245)</td>
<td>NT$28,276.88 (US$905)</td>
<td>NT$36,581.33 (US$1,171)</td>
<td>NT$50,703.56 (US$1,623)</td>
<td>NT$50,703.56 (US$1,623)</td>
<td>NT$50,703.56 (US$1,623)</td>
</tr>
<tr>
<td>QALYs</td>
<td>0.575</td>
<td>0.549</td>
<td>0.563</td>
<td>0.549</td>
<td>–NT$11,797.54 (–US$378)</td>
<td>–NT$462,840 (–US$14,811)</td>
</tr>
</tbody>
</table>

Note: NT$ were converted to US$ using a conversion rate of 0.032.
Scenario analysis conducted for mirogabalin 30 mg versus pregabalin 150 mg, pregabalin 300 mg, and pregabalin 600 mg are presented in Supporting Information Table S9, S10, and S11 (Appendix), respectively. These indicate that the base-case results are robust to changes in key parameters.

Probabilistic sensitivity analysis

PSA was conducted to estimate the robustness of results by way of simultaneous variation of all input parameters. The results of both head-to-head and NMA analysis confirmed the deterministic base case results with similar mean total costs and QALYs accumulated (Supporting Information Table S8).

In the cost-effectiveness plane for the head-to-head analysis (Figure 3), the majority of the points lie in the north-eastern quadrant, demonstrating that mirogabalin 30 mg is more effective and more costly than placebo. The CEAC for the head-to-head analysis (Figure 4) illustrates the probability of the intervention being cost-effective compared to the comparator at WTP thresholds. At the Taiwanese WTP threshold (approx. NT$1,750,000 [US$56,000]), mirogabalin 30 mg has a 100% probability of being more cost-effective than placebo.

In the cost-effectiveness plane of mirogabalin 30 mg versus pregabalin 150 mg and pregabalin 300 mg presented in Supporting Information Figure S5 and S6 (Appendix), respectively, the majority of points lie in the north-eastern quadrant of the planes, demonstrating that mirogabalin 30 mg is more effective and more costly. Mirogabalin 30 mg was found to dominate pregabalin 600 mg (more effective and less costly), with the majority of points lying in the south-eastern quadrant of the plane (Supporting Information Figure S7 [Appendix]).

The CEAC presented in Supporting Information Figure S8, S9, and S10 (Appendix) demonstrate that, at the Taiwanese WTP threshold (approx. NT$1,750,000 [US$56,000]), mirogabalin 30 mg is more cost-effective compared to pregabalin 150 mg, 300 mg, and 600 mg with probabilities of 92.7%, 94.2%, and 99.9%, respectively.

Discussion

The aim of this study was to develop an economic model in a transparent and flexible way that would allow the assessment of the cost-effectiveness of mirogabalin 30 mg for the treatment of PHN in a Taiwanese population. A Markov cohort model was developed based on a PLR of published economic evaluations for PHN.

The analysis was conducted for mirogabalin 30 mg versus placebo using clinical data from the J304 trial. In order to compare mirogabalin 30 mg with active treatments, a NMA was conducted. The point estimates for each comparator (i.e. mean difference in ADPS relative to mirogabalin 30 mg) were used to calculate the transition probabilities applied in the model.
The base-case deterministic analysis demonstrated that mirogabalin 30 mg was associated with an incremental QALY gain of 0.041 at an incremental cost of NT$11,231 (US$359) versus placebo (NT$274,567 [US$8,786]) resulting in an ICER of NT$273,949 (US$8,766). Probabilistic analysis confirmed the deterministic results. In the analysis versus active treatment using data from the NMAs, mirogabalin 30 mg was the cost-effective treatment option when compared to pregabalin 150 mg and 300 mg, with ICERs below the WTP threshold in Taiwan (approx. NT$1,750,000 [US$56,000]).

Table 2. Scenario analysis – PHN (J304 study).

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Variation</th>
<th>Low ICER (NT$)</th>
<th>High ICER (NT$)</th>
<th>Scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical staff visit costs – mild health state</td>
<td>±20%</td>
<td>267,211</td>
<td>281,924</td>
<td></td>
</tr>
<tr>
<td>Lab test costs – mild health state</td>
<td>±20%</td>
<td>273,209</td>
<td>275,926</td>
<td></td>
</tr>
<tr>
<td>Radiological test costs – mild health state</td>
<td>±20%</td>
<td>273,279</td>
<td>275,856</td>
<td></td>
</tr>
<tr>
<td>Medical staff visit costs – moderate health state</td>
<td>±20%</td>
<td>274,627</td>
<td>274,508</td>
<td></td>
</tr>
<tr>
<td>Lab test costs – moderate health state</td>
<td>±20%</td>
<td>274,597</td>
<td>274,538</td>
<td></td>
</tr>
<tr>
<td>Radiological test costs – moderate health state</td>
<td>±20%</td>
<td>274,578</td>
<td>274,557</td>
<td></td>
</tr>
<tr>
<td>Medical staff visit costs – severe health state</td>
<td>±20%</td>
<td>275,392</td>
<td>273,743</td>
<td></td>
</tr>
<tr>
<td>Lab test costs – severe health state</td>
<td>±20%</td>
<td>274,973</td>
<td>274,161</td>
<td></td>
</tr>
<tr>
<td>Radiological test costs – severe health state</td>
<td>±20%</td>
<td>274,712</td>
<td>274,423</td>
<td></td>
</tr>
<tr>
<td>Medical staff visit costs – off treatment</td>
<td>±20%</td>
<td>274,760</td>
<td>274,375</td>
<td></td>
</tr>
<tr>
<td>Lab test costs – off treatment</td>
<td>±20%</td>
<td>275,763</td>
<td>273,372</td>
<td></td>
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<tr>
<td>Radiological test costs – off treatment</td>
<td>±20%</td>
<td>275,366</td>
<td>273,768</td>
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</tr>
<tr>
<td>Health state utility – mild pain</td>
<td>±20%</td>
<td>439,832</td>
<td>199,577</td>
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</tr>
<tr>
<td>Health state utility – moderate pain</td>
<td>±20%</td>
<td>244,782</td>
<td>312,605</td>
<td></td>
</tr>
<tr>
<td>Health state utility – severe pain</td>
<td>±20%</td>
<td>260,484</td>
<td>290,260</td>
<td></td>
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<tr>
<td>Mirogabalin 30 mg biweekly cost</td>
<td>±5%</td>
<td>251,026</td>
<td>298,109</td>
<td></td>
</tr>
<tr>
<td>BSC biweekly cost</td>
<td>±5%</td>
<td>285,966</td>
<td>263,169</td>
<td></td>
</tr>
</tbody>
</table>

Utility source: Rodriguez et al. 388,237

Note: Costs and QALYs are rounded to the nearest whole number. NT$ were converted to US$ using a conversion rate of 0.03.

Figure 3. Cost-effectiveness plane – versus Placebo, PHN base-case analysis (J304).
This study is the first economic evaluation of mirogabalin, compared against the different doses of pregabalin treatments available for PHN in Taiwan. Our modeling approach was also consistent with the prior models published in PHN evaluation studies.

However, the analysis had its limitations. Given the lack of head-to-head comparisons between all treatments included in the model, efficacy and treatment discontinuation inputs were sourced from an NMA for use in the comparisons with active treatments. Since the population included in the model was patients with PHN in Taiwan, it was considered appropriate to use networks that included only studies with 100% Asian populations. By imposing this limit, comparators like gabapentin, which were licensed for the treatment of PHN, were excluded from the economic analysis because they were not included in the networks. Second, the NMA reported outcomes at week 14. In order to apply these across each model cycle (i.e. every 2 weeks), a proportion of this total change in ADPS was applied to each cycle. This proportion was based on the mean change in ADPS that occurred every 2 weeks in J304 and was not a direct reflection of the change in ADPS every two weeks that occurred across trials included in the NMA. Lastly, since long-term change in ADPS was not reported in the pivotal clinical trials, long-term effectiveness was extrapolated beyond week 14. Patients who had transitioned to an improved pain state between baseline and week 14 were assumed to stay on treatment. Those who did not transition to an improved pain state by week 14 discontinued treatment and moved “off-treatment,” returning to the health state in which they entered the model.

In conclusion, the results of this economic evaluation suggest that mirogabalin 30 mg, a potent and selective α2-δ-ligand, is a cost-effective treatment option for the management of PHN and should be included as a treatment option in Taiwan. The results were stable when performing simultaneous variations across all inputs (PSA) and across a range of scenarios.

Transparency

Declaration of funding

Financial support for this research was provided by Daiichi Sankyo Inc.

Declaration of financial/other interests

XY is an employee of Daiichi Sankyo Inc. EG is an employee of IQVIA, a consulting company that received financial support from Daiichi Sankyo. YFW and SJW are clinicians in Taiwan who received financial support for their contributions. JME peer reviewers on this manuscript have no relevant financial or other relationships to disclose.

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None reported.

Author contributions

All authors were involved in the conception and design, or analysis and interpretation of the data; the drafting of the paper or revising it critically for intellectual content; and the final approval of the version to be published.

Previous presentations

Parts of this manuscript were presented at the International Society for Pharmacoeconomics and Outcomes Research (ISPOR) Conference, 18–22 May 2019, New Orleans, USA as a poster presentation.

References


