Cost-effectiveness of Paliperidone depot versus oral medication in the treatment of schizophrenia in Austria

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Objectives
Schizophrenia is affecting young adults and amounts to approximately 80,000 people in Austria, suffering at least one time during their life from a psychotic episode, which meet the DSM-IV criteria of schizophrenia. Patients with schizophrenia are at high risk of relapse due to non- adherence of oral antipsychotic medication. The purpose of this analysis was to estimate the cost-effectiveness of switching to Paliperidone depot after first-line oral Olanzapine or Risperidone versus an oral treatment algorithm.

Methods
We developed a Cost-Utility-Model to simulate the consequences of two treatment algorithms; one arm with Paliperidone depot after treatment failure or stop due to adverse events (AEs) or other reasons (e.g. own decision) of Olanzapine or Risperidone versus a second arm with oral medication (starting also with Risperidone or Olanzapine followed by Quetiapine, Haloperidol, Ziprasidone and last-line Clozapine and no-treatment). Patients switch to next treatment option along the treatment path if the present treatment shows lack-of-effficacy (LOE) or AEs arise or due to other reasons. Markov-modeling techniques were used to estimate incidence of relapse, hospitalisation, treatment switch and death. The model includes eleven health-states. Markov-cycle length is 6 weeks. Probabilities were derived from clinical studies. Direct medical costs from published sources were used and expressed in 2011 Euro from the payer's perspective. The model was calculated over a 5-years time horizon. QALYs and costs were discounted at 5% p.a. Monte-Carlo simulation accounted for uncertainty.

Cohort definition
The model cohort comprises patients with diagnosed schizophrenia according the DSM-III or DSM-IV criteria, aged 40 years (between 18 and 65). All patients start with oral Olanzapine or Risperidone. After treatment stop due to LOE, AEs or other reasons, patients have the opportunity to switch to an alternative treatment; one group to Paliperidone depot and the second group to oral Quetiapine, Haloperidol, Ziprasidone and last-line Clozapine.

Results
Over a 5-year timeframe, costs associated with the use of Paliperidone depot after oral Olanzapine or Risperidone amounts to 28,328.94 € and are associated with 3.62 QALYs. Costs calculated for the oral treatment-path amounts to 26,338.23 € and 3.20 QALYs. The incremental-costs amount to 1,990.71 € per patient within 5 years. The treatment-path with Paliperidone depot leads to 0.42 QALYs gained per patients within 5 years. The incremental-cost per QALY gained amounts to 4,739.79 €. The model demonstrates that switching to Paliperidone depot is a cost-effective strategy compared to oral schizophrenia treatment.

Conclusion
A treatment switch to Paliperidone depot is a cost-effective alternative, improves treatment adherence and reduces health-care costs in the future and leads to higher quality-of-life.

References
A. Dragosits, C. Wolfenbätter, S., Olanzapine versus Haloperidol and Risperidone – Acute Phase Results of the North American Double-Blind Clozapine Trial, in: Neuropsychopharmacology, 1995
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Probabilistic-sensitivity-analysis demonstrated the robustness of the model regarding assumptions and input-parameters.

Fig. 1: Model Design

Fig. 2: Distribution of patients according to treatment adherence and treatment switch

Fig. 3a: PSA Paliperidone depot treatment-path vs. oral treatment-path

Fig. 3b: Acceptability curve

Fig. 3c: Comparison of costs and QALYs between Paliperidone depot treatment-path and oral treatment-path

The Markov-cohort description shows that 55% of patients who receive Paliperidone depot are still on treatment after 5-years and 24% have changed therapy after receiving a depot; 5% receive no treatment. In the oral treatment group 32% of patients are adherent to their first-line treatment and 54% have changed treatment to other oral medication; 7% receive no treatment after five years.

Monte Carlo probabilistic sensitivity analysis (PSA) pools the results of 5,000 trials plotting incremental cost versus incremental effects. Based on this, it creates acceptability curves to assess the likelihood of the comparators being cost-effective over a range of willingness to pay values in the Austrian setting. Sensitivity analysis revealed that the Paliperidone depot treatment-path is cost effective compared to the oral alternative in more than 73.2% (81.1%) of the simulations with a willingness to pay of 20,000 € (30,000 €).