Alanyl-glutamine Dipeptide (Dipeptiven®) in Total Parenteral Nutrition (TPN) Therapy in Critically Ill Italian Patients: A Pharmacoeconomic Simulation Model

Objective

- Several clinical trials have demonstrated that the supplementation of Dipeptiven® in critically ill patients in Intensive Care Units (ICUs) is associated with better clinical outcomes, such as reduction of the infection rate, shortening of ICU and hospital lengths of stay (LOS), and a trend toward reduced mortality, when compared to standard TPN regimens.
- Aim of the study is the pharmacoeconomic evaluation of Dipeptiven® vs. standard TPN in critically ill patients admitted to Italian ICUs.

Methods

Objective

- The aim of the study is the pharmacoeconomic evaluation of Dipeptiven® vs. standard TPN in critically ill patients admitted to Italian ICUs.
- The analysis is based on a Discrete Event Simulation model developed in TreeAgePro 2009 incorporating:
  a. baseline outcomes rates derived from the 2007 GVITI report (data from 200 Italian ICUs and over 60,000 patients, of which 23,000 for intensive therapies) [1];
  b. Dipeptiven® efficacy from meta-analysis of 15 published clinical trials [2-11] on critically ill patients. The meta-analysis was performed by means of a Bayesian random-effects model specified in WinBugs. The full posterior distribution of the effects was used for the patient-level simulation;
  c. National cost data in the perspective of the hospital.

Results

- In the base-case scenario, Dipeptiven® is expected to be more effective than standard TPN, as it would avoid almost one third (1,070 of 3,446) of deaths, about one sixth (316 of 3,446) of infections, and slightly reduce overall LOS.
- Dipeptiven® is also expected to be averagely less expensive than standard TPN, with a mean cost saving of € 300, as treatment cost is offset by reduction in ICU and antibiotic costs.
- Dipeptiven® is expected to averagely dominate standard TPN, as it results associated with better clinical and economic outcomes (Tab. V).

Conclusions

- Two previous meta-analyses and their updates demonstrated the effectiveness of ala-glu in reducing mortality and emerging infections in critically ill ICU patients.
- The Bayesian approach used to post-clinical trials results validation is very attractive in that it integrates very well with the micro-simulation technique, avoiding the whole distribution of effects.
- Dipeptiven® treatment is expected to be averagely less expensive than standard TPN, with a mean cost saving of about € 300.
- According to the model, ala-glu supplementation in Italian ICUs, besides improving patient outcomes, is very economically attractive: in 78% of simulation its use is expected to reduce overall costs.
- In the remaining simulations, life and infections saved have to be traded off with some extra expense, which is in any case low and could be considered fully justified.

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References