Cost-effectiveness of Tocilizumab for the Management of Rheumatoid Arthritis in Mexico

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Objectives: Rheumatoid arthritis (RA) is a chronic, progressive, inflammatory disease that affects physical functioning and quality-of-life and is associated with premature mortality and substantial economic burden. We aimed to assess the cost-effectiveness of tocilizumab added to disease-modifying antirheumatic drugs (DMARD) in patients with active RA despite DMARD therapy.

Methods: We compared tocilizumab 8 mg/kg every 4 weeks; infliximab 3 mg/kg (weeks 0, 2, 6, 14 and 22); etanercept 25 mg twice weekly and adalimumab 40 mg every 15 days11. All these drugs were administered in combination with mean weekly doses of MTX 17.5 mg. Two models were developed for economic evaluation. The first model included only 6-month acquisition costs of drugs and infusion-related cost for infliximab and tocilizumab; the second model consisted of a four-state Markov model with health states defined according to Disease Activity Score (DAS28): remission, low, moderate and high activity. The efficacy measure used for the first model was the ACR70 response (American College of Rheumatology) which is expressed as the proportion of patients who had 70% improvement compared to its original state, after 6 months of treatment; this parameter can be considered a surrogate measure of remission. In the second model, the measure of effectiveness was expressed as the mean number of days per patient in remission during a 2-year period. Response rates (Table 1) according to the ACR criteria reported in 10 clinical, randomized, double-blind, placebo-controlled trials were adjusted by using an indirect comparison.

The pharmacoeconomic study results The mean cost to achieve an ACR70 response is significantly lower for tocilizumab plus MTX ($17,138) combination. However, achieving an ACR70 response rate at 24 weeks of treatment, costs about $27,791 in etanercept plus MTX strategy, $29,997 in adalimumab plus MTX strategy and $46,310 in infliximab plus MTX strategy.

In pharmacoeconomic terms, it is said that the combination of tocilizumab at doses of 8 mg/kg and MTX is a dominant strategy over the other interventions discussed, which are defined as dominated strategies. Chart 2 shows the cost-effectiveness quadrant, where you can see that tocilizumab plus MTX combination stands down (ie less expensive) and right (ie more effective) in relation to other strategies being compared in the graph.

5-year analysis

In the Markov model we evaluated two important parameters: (i) the mean cumulative costs per patient, and (ii) cumulative remission days per patient. Both parameters were calculated for a 5-year period.

Table 3 shows the 5-year cost-effectiveness results. The same outcomes are presented in a graphic form by using a cost-effectiveness quadrant (Chart 3). Ascanbeseen, the tocilizumab 8 mg/kg and MTX combination is the dominant strategy, since its use implies both cost-savings of $623, $1,122 and $3,321 and gains of 9, 20 and 12 days in remission per patient compared with etanercept plus MTX, infliximab plus MTX and adalimumab plus MTX, respectively.

Conclusions: The pharmacoeconomic study results suggest that:

Tocilizumab shows a comparable effectiveness to that of anti-TNF agents regarding to ACR20 and ACR70 response rates.

Tocilizumab shows a marked superiority in ACR70 response rate in comparison to the anti-TNF agents effectiveness.

The cost-effectiveness profile of tocilizumab is favorable when compared with the anti-TNF option (etanercept, adalimumab or infliximab) as add-on therapy to traditional DMARDs, especially MTX, in patients with inadequate response to therapy with this group of drugs.

In the base case, tocilizumab 8 mg/kg was a dominant strategy, ie, less costly and more effective than any anti-TNF agent, investigated as part of a concurrent therapy strategy added to MTX treatment.

Whereas a wide range of settings in relation to mean weight of patients with RA candidates for combination therapy, we found that the strategy of providing tocilizumab at doses of 8 mg/kg every 15 days is a highly cost-effective intervention and even cost-saving in most cases, for the public health sector institutions in Mexico.

Results: 24-week analysis

Table 2 shows results from cost-effectiveness for 24 weeks therapy. The mean cost per patient for etanercept or tocilizumab 8 mg/kg ($4,418) than for etanercept ($5,020), infliximab ($5,484), and adalimumab ($5,655), each combined with MTX. Differences in costs per patient favor tocilizumab plus MTX, represent savings of $561, $1,065, and $2,316 for a 24-week period, with respect to etanercept plus MTX, infliximab plus MTX and adalimumab plus MTX combinations, respectively.