Impact of Different Thresholds on Recommendations Made through Cost-Effectiveness Studies: An Example from Chronic Lymphocytic Leukemia

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BACKGROUND

The core result of a pharmacoeconomic assessment is the incremental cost-effectiveness ratio (ICER) which measures the cost for an extra unit of benefit gained from the recommendation of a technology instead of the comparator (s). For new technologies to be recommended, the ICER has to be compared to a "critical ratio" that should represent the maximum acceptable cost of an extra unit of benefit.

OBJECTIVE

This study aims to demonstrate the impact of different cost-effectiveness thresholds (λ) on the recommendation of technologies in cost-effectiveness analyses worldwide.

METHODS

Structured electronic searches of Medline, Lilacs, Center for Reviews and Dissemination, Cochrane Library, and Embase were conducted to identify pharmacoeconomic analyses that compared chemotherapy+rituximab (CT+R) with chemotherapy alone (CT).

The Incremental Cost-Effectiveness Ratios (ICERs) were extracted from the publications, converted to PPP-USD for the analysis year, and compared to various values of λ.

The values of λ were chosen to represent a variety of approaches from around the world:

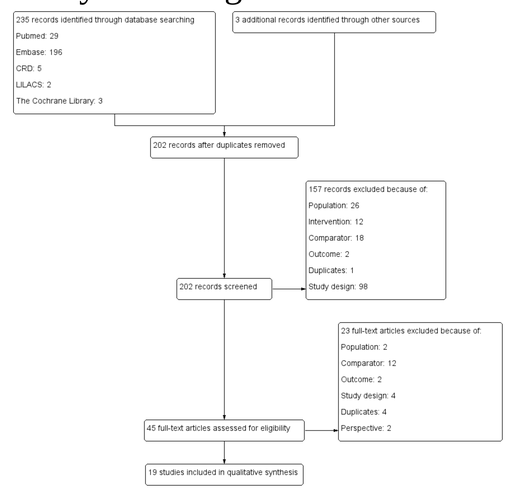
(i) λ in the country of the analysis, if available;
(ii) 50,000 USD/QALY;
(iii) the opportunity costs threshold (κ);
(iv) 3 GDP per capita/QALY
(v) 2 GDP per capita/QALY
(vi) 1 GDP per capita/QALY.

This review was registered a priori in PROSPERO (**CRD42021244113**).

RESULTS

19 references were included in the study (**Figure 1**).

Figure 1. Study flow diagram



General characteristics of the studies

(i) Three-state models;
(ii) 14 countries represented;
(iii) Mostly markov models;
(iv) Time horizons varying from 10 years to lifetime;
(v) Discount rates varying from 1.5 to 5%.
(vi) Four comparisons:

a) Fludarabine-Cyclophosphamide-Rituximab (FCR) vs. Fludarabine-Cyclophosphamide (FC) (N=12)
b) Chlorambucil-rituximab (ClbR) vs. chlorambucil (Clb) (N=5)
c) Ibrutinib-rituximab (IR) vs. ibrutinib (I) (N=2)
d) Bendamustine-rituximab (BR) vs. bendamustine (B) (N=1)

Thirteen studies reported funding by Roche, the producer of rituximab.

Comparisons

IR vs. I

(i) N=2
(ii) Canada and USA
(iii) IR dominated

BR vs. B

(i) N=1
(ii) UK
(iii) ICER = 928,364 GBP/QALY (unreasonable)

ClbR vs. Clb

(i) N=5
(ii) All studies were funded by Roche
(iii) Europe
(iv) All studies considered the ClbR cost-effective at 2 and 3 GDP per capita/QALY
(v) ClbR was not cost-effective compared to κ.

FCR vs. FC

(i) N=12
(ii) Funded by Roche (N=10)
(iii) At the κ, 8 studies found FCR not cost-effective
(iv) All studies considered FCR cost-effective at 3 GDP per capita/QALY

CONCLUSION

Regarding FCR vs. FC and ClbR vs. Clb, the combination of rituximab is considered cost-effective under most typically accepted thresholds. Nevertheless, the approach taken by regulators on the threshold might change the recommendation's direction.

Support: