

Cost Minimization Analysis of Dexamethasone Intravitreal Implant and Ranibizumab for RVO-Macular Edema in China

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BACKGROUND

- Macular Edema (ME) is divided into branch retinal vein occlusive macular edema(BRVO-ME) and central retinal vein occlusive macular edema(CRVO-ME), which can cause severe vision loss.
- Macular edema can appear at any stage of RVO and currently there is no effective treatment.
- The treatment methods include drug treatment, surgical treatment, and laser treatment. Drug treatment includes two categories, glucocorticoids and anti-vascular endothelial growth factor (VEGF).Anti-VEGF has a short curative effect and high cost, leading to poor compliance.
- Dexamethasone intravitreal implants take effect quickly, have a long-lasting effect, are well tolerated, and can reduce the burden of frequent injections. A Chinese study showed that dexamethasone intravitreal implants and ranibizumab were equally effective in treating macular edema at 6 months.

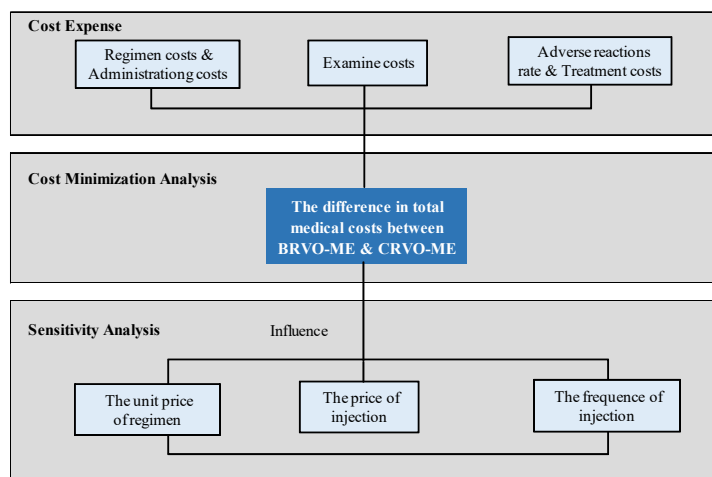
OBJECTIVES

- The study aimed to examine the cost minimization of dexamethasone intravitreal implants for macular edema caused by branch retinal vein occlusion (BRVO) or central retinal vein occlusion (CRVO) in China.

METHODS

- From a payer's perspective, the cost-minimization analysis method was used to calculate and compare the direct medical costs of dexamethasone intravitreal implant and ranibizumab in the treatment of macular edema for 6 months in China.
- Adverse reactions only included elevated intraocular pressure.
- Only the cost of regimen (including the cost of the drug itself and the cost of the injection process) is considered in this model. Other costs including adjuvant treatments, outpatient registration, examination are assumed to be the same among the different regimens.
- This model only considers the medication of RVO-ME patients in outpatient treatment, regardless of hospitalization medication.
- The research cycle of this Cost Minimization Analysis Model is half a year, which is derived from main references related to this study.
- Cost data was obtained through clinical expert consultation and drug tender data. Other data sources included literature retrieval and expert consultation.

Fig.1 Overview of the CMA development



RESULTS

- Given the similar clinical effectiveness in real world evidence, the direct medical cost of dexamethasone intravitreal implant for BRVO-ME was USD1,574 (RMB11,016) less than that of ranibizumab (Table 1). For CRVO-ME, the direct medical cost of dexamethasone intravitreal implant was USD1,157(RMB8,101) less than that of ranibizumab (Table 2). The univariate sensitivity analysis showed that the two factors of the greatest impact were the number of dexamethasone intravitreal implant injections and the number of ranibizumab injections.

Table 1 The cost minimization results in BRVO-ME(yuan)

Costs	Dexamethasone Intravitreal Implant	Ranibizumab	Difference
Total costs of regimen	4,837.15	13,933.36	-9,096.21
Total costs of regimen administration	1,004.40	2,929.50	-1,925.10
Total costs of initial examination	433.00	433.00	0.00
Total costs of follow-up examination	1,040.00	1,040.00	0.00
Total costs of adverse reactions treatment	5.00	0.00	5.00
Total costs	7,319.55	18,335.86	-11,016.31

Table 2 The cost minimization results in CRVO-ME(yuan)

Costs	Dexamethasone Intravitreal Implant	Ranibizumab	Difference
Total costs of regimen	6,852.63	13,535.26	-6,682.63
Total costs of regimen administration	1,422.90	2,845.80	-1,422.90
Total costs of initial examination	433.00	433.00	0.00
Total costs of follow-up examination	1,040.00	1,040.00	0.00
Total costs of adverse reactions treatment	5.00	0.00	5.00
Total costs	9,753.53	17,854.06	-8,100.53

- The univariate sensitivity analysis showed that the two factors of the greatest impact were the number of dexamethasone intravitreal implant injections and the number of ranibizumab injections(Table3-4).

Table 3 Results of sensitivity analysis for BRVO-ME(yuan)

	Lower	Base Case	Upper
The unit price of Dexamethasone Intravitreal Implant	-11,976.31	-11,016.31	-11,016.31
The unit price of Ranibizumab	-8,251.31	-11,016.31	-11,016.31
The price of injection	-9,884.71	-11,016.31	-13,001.21
The number of Dexamethasone Intravitreal Implant injections	-12,963.49	-11,016.31	-9,069.12
The number of Ranibizumab injections	-7,161.94	-11,016.31	-14,870.68

Table 4 Results of sensitivity analysis for CRVO-ME(yuan)

	Lower	Base Case	Upper
The unit price of Dexamethasone Intravitreal Implant	-9,460.53	-8,100.53	-8,100.53
The unit price of Ranibizumab	-5,414.53	-8,100.53	-8,100.53
The price of injection	-7,264.13	-8,100.53	-9,567.63
The number of Dexamethasone Intravitreal Implant injections	-11,508.10	-8,100.53	-4,692.96
The number of Ranibizumab injections	-1,355.39	-8,100.53	-14,845.68

CONCLUSIONS

- The direct medical cost of dexamethasone intravitreal implant for BRVO-ME and CRVO-ME was less than that of ranibizumab.