

Intraocular Lens for Cataract Surgery* "A hope to see again"



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Policy Brief

Summary

Cataract is the leading cause of blindness worldwide. In India cataract has been reported to be responsible for 50-80% of the blindness in the country most prevalent in older population. Women and people with low socioeconomic status are more at risk. In order to bridge the gap between the evidence-to-policy, a comprehensive Health Technology Assessment (HTA) study was undertaken by Health Technology Assessment in India Secretariat (HTAI Sec.) to examine the comparative effectiveness and cost-effectiveness of various cataract surgeries and intraocular lenses (IOLs). Overall the study suggested that Manual Small Incision Cataract Surgery (MSICS) with Rigid PMMA lens was found to be the most appropriate strategy in a country like India where age related cataract were more reported in rural areas lacking in medical infrastructure and among the people with low socioeconomic status.



Courtesy: International Agency for the Prevention of Blindness (IAPB)

Background

Cataract is the leading cause of blindness (51%) and low vision (33%) worldwide (Fig. 1) (1). The prevalence of blindness in India is around 1% where cataract contributes for almost 60-70% (2). As per the ongoing national blindness survey 2017-2018, the overall prevalence of blindness has reduced to almost 0.50% but cataract is still as prevalent as 70 % (Fig. 2).

Under Rashtriya Swasthya Bima Yojna (RSBY) cataract is one of the most utilized (16-36%) packages in most of the states. RSBY offers four different packages for cataract ranging from 4000 to 7000 INR (Table-1) and among them "Cataract with foldable Intraocular lens (IOL) by Phacoemulsification tech. Unilateral" of 7000 INR was found to be the most utilized cataract package (3).

Experts reported that most common surgical options for the treatment of cataract in India are Phacoemulsification (Phaco) and Manual Small Incision cataract surgery (MSICS) that utilizes foldable Acrylic and rigid PMMA lenses, respectively. However, there is a lack of evidence in Indian context for comparing the clinical and cost-effectiveness of these surgical interventions and IOLs for the treatment of age-related cataracts.

Recommendations

- On the basis of clinical efficacy, cost, accessibility, availability and feasibility, MSICS with rigid lens is most appropriate intervention to treat cataract patients in India in current scenario.
- Phacoemulsification cataract surgery can be provided in those areas where infrastructure and experts are available for Phaco. surgery.
- The benefit packages for Phaco. with foldable lens and Small Incision Cataract Surgery with rigid PMMA lenses may cost as 9606 INR and 7405 INR respectively.
- The package is inclusive of initial OPD consultation, diagnostic tests (optometry, vision test etc.), counselling, pre-surgery/ anaesthetics, surgery, ward, drugs, medical consumables, lens, food for patient and one attendant and one follow-up visit cost.

* The policy brief is based upon the Health Technology Assessment of "intraocular lenses for treatment of age-related cataracts in India" - July 2018 and can be found on the link:

https://dhr.gov.in/sites/default/files/htaincatract_0.pdf

Choice of cataract surgery and lenses in India are made depending upon the clinical, economic and social conditions of patients and surgeon's expertise, infrastructure available at clinic etc. To bridge this gap between evidence and decision for an evidence-informed policymaking, a comprehensive Health Technology Assessment (HTA) study was undertaken by Health Technology Assessment in India Secretariat (HTAI In Sec.) to examine the clinical and cost-effectiveness of various cataract surgeries and intraocular lenses (IOLs) for the treatment of age-related cataracts. Since this HTA topic was given to the HTAI In Sec. by RSBY and Phaco. and MSICS was the most common intervention the two were compared for their effectiveness and equity implications.

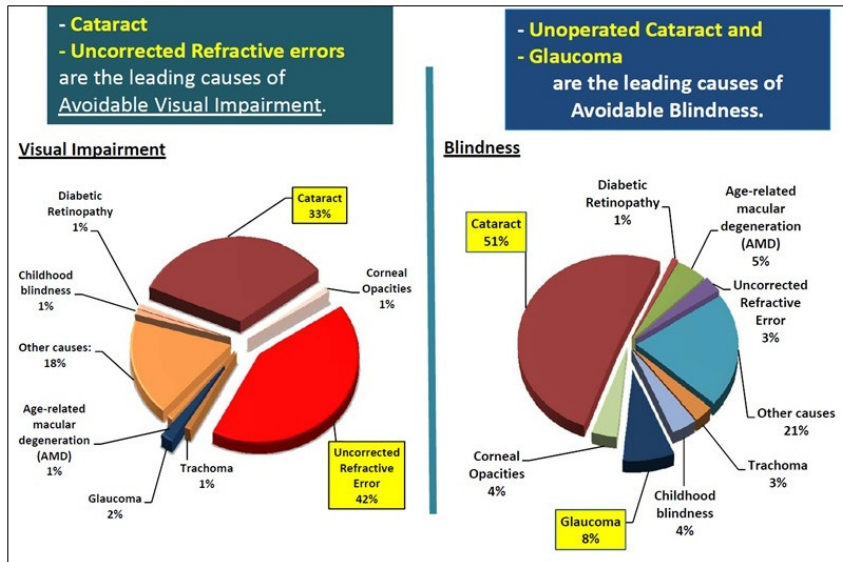


Figure 1. Visual Impairment and Blindness 2010 World Health Organization

Clinical and Cost-Effectiveness

The study included the secondary as well as primary data collection, wherever required. Phaco. and MSICS showed comparable clinical efficacy in terms of visual acuity and complications. There were comparable clinical benefits with rigid PMMA and foldable

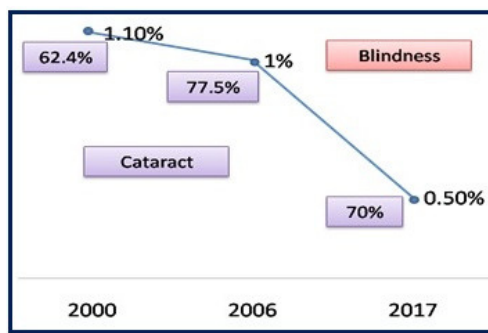


Figure 2. Prevalence of Blindness and cataract contribution.

acrylic lenses when implanted after a Phaco. surgery. There is also not enough evidence suggesting the superiority of multifocal lens over monofocal or the role of IOL material in developing posterior capsule opacification (PCO). Overall, MSICS with rigid monofocal lenses sounds a wise strategy to cater to the huge backlog of cataract patients in India without compromising the quality of healthcare. There are very few studies reporting quantitative

QALY for for different types of cataract surgeries (Phaco. and MSICS) and lenses (rigid and foldable lenses). Our Study showed that MSICS leads to a better VRQoL compared to Phaco (Fig. 4(a)). However, the economic evaluation depicted phaco with foldable lens to be cost-effective over MSICS with rigid lenses (Fig. 4(b) with an incremental

cost-effectiveness ratio of 3862.79 INR per QALY, Incremental Net Health Benefit of 0.55 QALYs and Incremental Net Monetary Benefit of 63255.2 INR.

There was no generalizable literature available on the cost of cataract surgery/ lenses in India. Therefore, a primary collection was done in secondary and tertiary hospital settings. Average Cost of Cataract Surgery package from three secondary centers was calculated to be 9606 INR for Phaco. and 7405 INR for MSICS while in tertiary setting it came out to be 13017.51 INR and 9215.89 INR, respectively. The package included OPD consultation, diagnostic tests (optometry, vision test etc.),

Quality Adjusted Life Years Gained -QALY (4)

- QALY is a measure of gain in expected lifespan resulting from an intervention weighed by the quality of that life e.g. an intervention that leads to a five-year gain in life expectancy, but implies considerable pain during those years might be estimated to have a lower QALY than an intervention that results in four-year gain, but with less pain during that period.
- QALY is a generic measure of health and offers the potential to compare the health gain across different diseases and hence provide a rationale to decide while making investment across different health programmes in different areas of health care, such as treatments for heart disease and cancer, and to assess the opportunity cost (on the budget) of adopting programmes.
- EQ5D is the most utilized tool worldwide to measure QoL

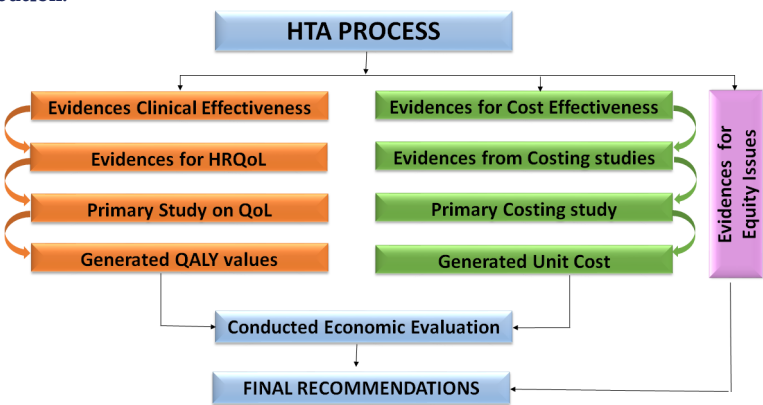
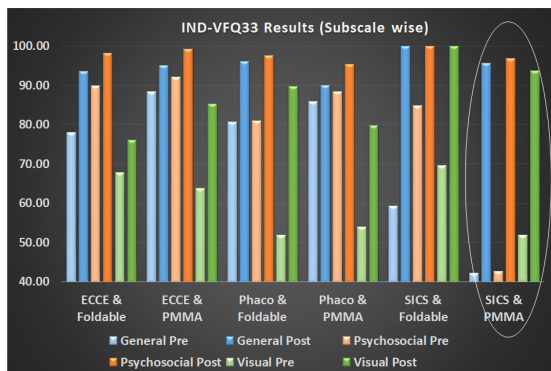


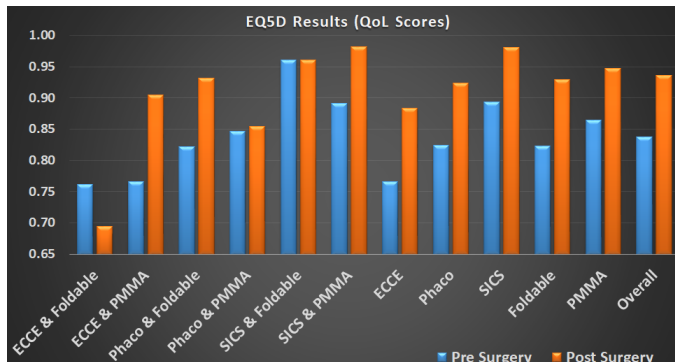
Figure 3. HTA overview

Vision related quality of life -VRQoL (5)

- VRQoL represents the degree to which vision impacts an individual's ability to complete activities of daily living and one's social, emotional and economic well-being.
- It is a specific measure of visual impairment and can be assessed by measuring the degree of impairment experienced in activities of daily living that rely on sight.
- A disease specific tool (such as IND-VFQ33 for cataract) is used to measure the QoL



(a)



(b)

Figure 4. Pre and Post surgery scores for (a) EQ5D and (b) IND-VFQ-33 subscales for different combinations of surgery and IOLs

Policy Implications

counseling, pre-surgery/ anesthetics, surgery, ward, drugs, medical consumables, lens, food for patient and one attendant and one follow-up visit cost.

RSBY was initially designed to target only the Below Poverty Line (BPL) households but has been expanded to cover other defined categories of unorganized workers (2).

Equity Considerations

In terms of the suitability depending upon the health service determinants, resources available, accessibility, cost and clinical effectiveness etc. in the rural and low socioeconomic setting where cataract prevalence was most MSICS being less technology dependent seems to be advantageous for high-volume case-loads of age-related cataract whilst maintaining excellent visual outcomes. MSICS was mostly performed at secondary level hospitals without any requirement of the constant power supply while Phaco. was performed mostly at the tertiary level, requires high capital investment and recurring expenditures of the Phaco. machine and consumables and a specially trained personnel to handle the machine (6). Moreover, indigenous PMMA that is used in MSICS would be less expensive in contrast to the foldable lens used in Phaco. which is mostly imported and expensive (6).

As per the ongoing Blindness Survey of India (2017-18), cataract prevalence is estimated to be almost 4% in the 50+ age population of the country. Upon extrapolation of evidence, it was seen that treating all these patients with a combination of SICS with rigid lens may lead to a cost saving of 17.3 b. INR.

Studies reported that there was a provider-consumer mismatch for cataract in India i.e. cataract cases and backlogs were reported more from the rural area (7) and most of the ophthalmologists were concentrated in the urban areas. Moreover, cataract prevalence was more in the prevalence was more in the uneducated population with low socioeconomic status (8).

According to the 2011 census, 70% of Indian population (mostly poor) reside in rural areas (9) where most of the cataract cases were reported (7) therefore, for a public health programme MSICS with rigid lens seems to be beneficial without compromising the quality of care and extra cost saving will help to cater more cataract patients/ backlogs.

Conclusion

Both Phaco. and MSICS showed comparable clinical efficacy in terms of visual acuity and complications. Moreover, the clinical outcome of the rigid PMMA and acrylic foldable were also equally good. However, the cost of MSICS with rigid lens came to be lesser than phaco. with foldable lens and also MSICS is less technology dependent hence MSICS with rigid lens seems advantageous in rural settings where the majority of cataract cases were reported and also help to cater more cataract patients.

Therefore, for a public health programme in a populated and diverse country having enormous socio-economic differences, SICS seems to be more appropriate intervention to address the large backlog of cataracts cases.

Key Findings

- Phaco vs. MSICS - Comparable Clinical Efficacy in terms of VA and complications.
- Foldable vs. Rigid PMMA lenses - Comparable Clinical Efficacy.
- [MSICS + Rigid PMMA lens] vs. [Phaco. + Foldable lens] :
 - [MSICS + Rigid PMMA] → Better VRQoL
 - [Phaco.+ foldable lens] → 0.57 QALY Gain
 - [MSICS + Rigid PMMA] → Less Costly
- MSICS - Less technology dependent mostly performed at secondary hospitals
- Phaco. - More technology dependent, require good infrastructure and performed mainly at tertiary level.

Sources

1. WHO. World Health Report, Visual Impairment and Blindness, 2010.
2. National Programme for Control of Blindness Surveys. npcb.nic.in/
3. RSBY::Rashtriya Swasthya Bima Yojna. http://www.rsbv.gov.in/
4. Methods for the Economic Evaluation of Health Care Programmes. 4th Edition. Oxford Press.
5. Finger RP et al. Investig Ophthalmol Vis Sci. 2011, 52(9):6081-8.
6. Ruit et al. Am J Ophthalmol. 2007, 143(1):32-38.
7. Vajpeyi et al. Ophthalmic Res. 1999;31(2):86-92.
8. Rakhi Dandona LD. Br J Ophthalmol. 2001; (85):1484-1488.
9. http://censusindia.gov.in/