Cataract surgical rate in Yemen: 2012

Saleh A. Al-Akily a; Mutahar Y. AlShaera a; Mahfouth A. Bamashmus a,b,⇑; Abdulmoghni O. AlBarraga a; Tawfik K. Alkhatiba a; Hisham A. Al-Akhleeb a

Abstract

Objective: To determine cataract surgical rate (CSR) in 2012 (01 January to 31 December 2012) in 22 Governorates of Yemen in order to identify the needs to reduce cataract related blindness.

Methods: A standardized questionnaire was sent to the 184 eye units in governmental, university, military, private and charity clinics and hospitals in Yemen.

Results: The response rate to the questionnaire was 80.7%, and the collected data are summarized. During the 12-month period, a total of 62,577 cataract surgeries were performed by 268 ophthalmology specialists and residents. The cataract surgical rate was 2473 cataract operations per million inhabitants per year. Intraocular lens implantation was performed on 98% of the cases.

Conclusion: CSR has increased in Yemen in the recent years but is still below the target suggested by WHO. There is need to increase the cataract surgical rate in Yemen mainly in rural areas. Inadequate number of eye surgeons, limited accessibility of cataract surgical services in rural areas and the affordability of surgery to large sections of society are major constraints that have to be addressed. The information from this study will help and enable Ministry of Health and other eye care providers to more equitably disperse trained ophthalmic personnel and eye units in Yemeni governorates.

Keywords: Cataract, Cataract surgical rate, Yemen

© 2016 The Authors. Production and hosting by Elsevier B.V. on behalf of Saudi Ophthalmological Society, King Saud University. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). http://dx.doi.org/10.1016/j.sjopt.2016.11.007

Introduction

Republic of Yemen is located in the south west part of the Arab Peninsula with an area of 555,000 square kilometers. Yemen population is around 25.3 Million distributed in 21 governorates in addition to the capital city of Sana.1 About 68.2% of the population lives in rural areas.2

Yemen is one of the WHO Eastern Mediterranean Region countries, the estimated prevalence of blindness in this region is 0.973,4 and Yemen is regarded as one of the countries with high prevalence rate of blindness.5,6

Cataract blindness is a public health problem of major proportions in developing countries. The major contributors to blindness in Yemen are cataract (49–70%), glaucoma (11%), retinal diseases (9–10%), corneal diseases including microbial and traumatic corneal opacities (5–9%) and others.5,6

Cataract-related blindness treatment is one of the priorities of WHO and the International Agency for the Prevention of Blindness especially after the presentation of the VISION 2020: the Right to Sight initiative in 1999. However, 75% of blindness is avoidable, defined as blindness that can be either treated or prevented by a cataract surgery which is a successful, cost-effective intervention.7 One of the VISION 2020 strategies is monitoring the cataract surgical rate (CSR) and evaluating its trend over time. The CSR is defined as the number of cataract surgeries per million population.
per year and it is an international recognized critical index of cataract surgery service activity and an indicator of the availability and accessibility of the service to the population. Globally CSR ranges from 100 to 1,100 per million population.6 In Yemen CSR in 2003 was 1560 and in 2012 was 2473.

Apart from the ophthalmic situation analysis survey in 2003,9 there is still lack of information describing eye health care services in Yemen by measurable qualitative parameters. Health care in Yemen is going through a comprehensive process of transformation.12 The affordability and availability of eye health care services are affected by various changes strongly related to the socio-economic situation of Yemen.

The aim of this study which is done in 2012 was to estimate the CSR after nine years since the 2003 study.6 The outcome of this study is going to help decision makers in the Ministry of Health Population and other eye care providers in updating short and long term strategies for the reduction and prevention of blindness in the framework of the global initiative “Vision 2020 – the right to sight”.10

Patients and methods

This retrospective descriptive study was used to determine the number and type of cataract surgeries performed in Yemen in 2012 (01 January to 31 December 2012). Ethical approval from Nebras Health Society was obtained. Initially all cataract units were identified throughout Yemen. A standardized questionnaire (Vision 2020 form B)11 was used by the data collection team to collect information regarding the cataract surgical rate (total number of cataract operations performed within a year per one million inhabitants) in 2012. Those with more than 1,000 cataract surgeries per year were classified as group A, those with 500–1000 were classified as group B and those with less than 500 cataract surgeries were classified as group C.

Data were obtained by information gathered during personal visits by the data collection team to the 184 eye units in governmental, university, military, private and NGOs clinics and hospitals. Information regarding CSR was collected through case records, hospital administration sources and/or theater data.

Results

The response rate to the questionnaire was 80.7%. To increase the accuracy and quality of data, the collected information was obtained from theater lists, case records and hospital administration data. During the 12-month period, a total of 62,577 cataract surgeries were performed by 268 ophthalmology specialists. The majority of cataract surgeries (61.54%) were performed in the private sector facilities. The cataract surgical rate was 2,473 operations per million inhabitants per year. Intraocular lens implantation was performed on 98.02% of the cases. Table 1 shows distribution of ophthalmologists and cataract surgeries by governors in 2012.

The extracapsular cataract extraction was the leading technique in cataract surgery (81.9%); however, in few centers the phacoemulsification cataract surgery is used (17.9%). Intracapsular cataract extraction was done in (0.2%) of cases.

Discussion

The prevalence of blindness and visual impairment in Yemen is among the highest rate in Eastern Mediterranean Region countries.12,13 The prevalence of blindness due to cataract increases with age.14–16 Cataract related blindness in Yemen is regarded as the most common cause of blindness.5,6

The cataract surgical rate (CSR) is one of the main indicators of eye care services and it indicates the number of cataract operations per million populations. CSR is high in well developed countries ranging between 4000 and 6000 surgeries.17,18 The CSR in many developing countries in Africa and Asia is between 500 and 2000.18,19 The CSR in Yemen in 2003 was 15609 and increased to 2473 in the current study done in 2012.

From the study done in 20039 the CSR of 1560 should have increased to 2500 cataract surgeries per million populations by the year 2005 and to 3000 by the year 2010 in order to decrease the backlog of cataract related blindness in Yemen.20 This was not achieved mostly due to deficiency in ophthalmic personnel distribution in many governors and there was very little increase in establishing eye units in those governors with lack in eye units.21–23 Other causes of not achieving the targeted CSR number estimated in the previous study7 are long distances from surgical centers, cost of surgery to the poor Yemeni people and lack of public awareness. In addition to that Yemen in 2011 has gone through major political and socioeconomic difficulties (Arab Spring) which affected the health system including ophthalmic human resources and eye care infrastructure in the whole country.24,25

Cataract surgical rate in Yemen varies between governorates and is shown in Fig. 2. Six governorates (Sana’a City, Aden, Taiz, Hadramout, Hodeidah and Dhala) have CSR of more than 1000. Three governorates (Ibb, Dhamar and Sada) have CSR of 500 to 1000. The remaining thirteen governorates have CSR of less than 500.

Majority of cataract surgeries (81%) were performed in five governorates (Sana’a City (32%), Hodeidah (21%), Taiz (10.7%), Aden (8.6%) and Hadramout (8.5%). Four governorates (Jawf, Mahara, Raymah and Soqatra) had neither eye units nor ophthalmologists. Because of limited governmental resources for health care system the private medical sector is filling the defects in public sector so 61.5% of cataract surgeries are performed in the private sector eye units and 21.8% of cataract surgeries are performed in eye camps which also contribute to increase the awareness of public in rural areas toward cataract related blindness.
Extracapsular cataract surgery is still the main technique for performing cataract surgery in Yemen and accounted for 81.9%. Phacoemulsification surgery has increased over the years where it accounted for 0.8% in 2003 to 17.9% in 2012. This increment in percentage of phacoemulsification surgery is still low compared to neighboring countries where it is the major technique for cataract surgery. The reason for this is the lack of training of ophthalmic personnel in phaco technique and the low number of eye centers with phacoemulsification surgery services. In 2003 the intraocular lens implantation was 71.6%  and this number has increased to 98.02% in 2012. Intracapsular cataract surgeries were recorded on very rare occasions.

The main limitation of our study is that we couldn’t get information of intraoperative and postoperative complications and the final visual outcome of the surgeries performed.

Table 1. Distribution of ophthalmologists and cataract surgery by Governorates (2012).

| Governorate | Population | Ophthalmologist/100,000 population | Total cataract surgery | Cataract surgical rate (CSR) |
|-------------|------------|-----------------------------------|------------------------|-------------------------------|
| Sana’a City | 2,648,062  | 4.50                              | 20,024                 | 7562                          |
| Sana’a      | 1,081,907  | 0.92                              | 48                     | 44                            |
| Aden        | 794,363    | 5.67                              | 5376                   | 6768                          |
| Taiz        | 2,929,557  | 0.96                              | 6690                   | 2284                          |
| Hadramout   | 1,313,225  | 1.60                              | 5331                   | 4060                          |
| Hodeidah    | 2,795,897  | 0.47                              | 13,200                 | 4721                          |
| Ibb         | 2,604,358  | 0.35                              | 1706                   | 655                           |
| Dhamar      | 1,711,037  | 0.29                              | 1236                   | 722                           |
| Al-Beidah   | 685,306    | 0.15                              | 170                    | 248                           |
| Mahweet     | 622,306    | 0.16                              | 0                      | 0                             |
| Dhalā      | 621,287    | 0.64                              | 1123                   | 1808                          |
| Lahj        | 899,187    | 0.33                              | 152                    | 169                           |
| Hajja       | 1,883,241  | 0.11                              | 165                    | 88                            |
| Sada        | 922,759    | 0.11                              | 608                    | 659                           |
| Shabwa      | 567,049    | 0.35                              | 43                     | 76                            |
| Amran       | 1,180,759  | 0.17                              | 242                    | 205                           |
| Abyan       | 533,165    | 0.38                              | 0                      | 0                             |
| Mareb       | 302,613    | 0                                 | 0                      | 0                             |
| Jawf        | 576,546    | 0                                 | 0                      | 0                             |
| Mahara      | 127,380    | 0                                 | 0                      | 0                             |
| Raymah      | 502,027    | 0                                 | 0                      | 0                             |
| Soqatra     | 80,000     | 0                                 | 0                      | 0                             |
| Eyecamps    | –          | –                                 | –                      | –                             |
| Total       | 25,382,032 | 1.06                              | 62,577                 | 2473                          |

Figure 1. Total cataract surgery done by governmental, private eye units and eye camps in 2012 and 2003.
Rapid assessment of cataract surgeries (RACCS) in Yemen was planned to be done in 2008 but it was postponed because of political instability. The CSR can be increased by developing ophthalmic human resources through improving surgical training in cataract surgery mainly in the governorates with the lowest rate of CSR. The current CSR of 2473 is below the line with the WHO recommendations for the Eastern Mediterranean Region countries. Although this number is considered good to control the new cases of cataract that occur in the Yemeni population but when we talk about the prevalence of cataract among the population it reaches to 5000 cataract cases per million populations per year. This means that there is a backlog of cataract cases and performing 2473 cataract surgery per million population only deals partially with the new cases without touching the backlog of cataract cases.

Public awareness of the surgical treatment for cataract should be increased through education in schools and media. Phacoemulsification surgery should be the standard technique in the near future and this can be achieved through workshops and training wet-laboratory sessions for ophthalmic personnel. International Council of Ophthalmology (ICO) has helped in improving cataract surgery techniques in Yemen by sponsoring fellowship grants to Yemeni ophthalmologists for phacoemulsification surgery courses in India. A long term quality analysis of cataract surgery in Yemen is advisable. Inadequate number of eye surgeons, limited accessibility of cataract surgical services in rural areas and the affordability of surgery to large sections of society are major constraints. There is need to increase the cataract surgical rate in Yemen mainly in rural areas.

**Conflict of interest**

The authors have not disclosed any affiliation or financial involvement with organizations or entities with a direct financial interest in the subject matter or materials discussed in the manuscript. No funding was received for this work from any organization.

**Acknowledgements**

This study was financially sponsored by Tawasul Charity Corporation and Nebras Health Society. Appreciation is sincerely given to all members of the data collecting team.
References

1. www.nic.gov.ye.
2. www.tradingeconomics.com/yemen/urban-population-wb-data.html.
3. Resnikoff S, Pascolini D, Etyaale D, Kocur I, Pararajasegaram R, Pokharel G, et al. Global data on visual impairment in the year 2002.
4. Pascolini D, Mariotti SP. Global estimates of visual impairment: 2010. Br J Ophthalmol 2012;96:614–8.
5. Al-Akily S, Bamashmus M. Causes of blindness among adult Yemenis: a hospital-based study. Middle East Afr J Ophthalmol 2008;15:3–6.
6. Al-Akily SA, Bamashmus MA, Al-Mohammadi KA. Causes of blindness in people aged 50 years and over: community-based versus hospital-based study. East Mediterr Health J 2010;16:942–6.
7. Baltussen R, Sylla M, Mariotti SP. Cost-effectiveness analysis of cataract surgery: a global and regional analysis. Bull World Health Organ 2004;82(5):338–45.
8. Foster A. Vision 2020: the cataract challenge. Commun Eye Heal 2000;13:17–9.
9. Al-Akily S, Bamashmus M, AlBarrag A. Cataract surgical rate in Yemen. Saudi J Ophthalmol 2008;22(1):3–7.
10. Al-Khatib T, Ahmed A, Hameed A. Rapid assessment of avoidable blindness in Amran and Lahj governorates, Yemen. Sudanese J Ophthalmol 2013;5(1):9–16.
11. Vision 2020 – the right to sight. <www.ispb.org>.
12. Bamashmus M, Al-Akily S. Eye Health care services in Eastern Mediterranean region countries. J Arab Board Med Spec 2006;8(3):312–7.
13. VISION 2020: The Right to Sight. What causes blindness and how does VISION 2020 fight it? <http://www.v2020.org/page.asp?section_000100010002> accessed May 10, 2008.
14. Abou-Gareeb I, Lewallen S, Basseet K, Courtright P. Gender and blindness: a meta-analysis of population-based prevalence surveys. Ophthalmic Epidemiol 2001;8:39–56.
15. Zhang M, Wu X, Li L, Huang Y, Wang G, Lam J, et al. Understanding barriers to cataract surgery among older persons in suburban China through focus groups. Ophthalmic Epidemiol 2011;18:179–86.
16. Gollogly HE, Hodge DO, St Sauver JL, Erie JC. Increasing incidence of cataract surgery: population-based study. J Cataract Refract Surg 2013;39(9):1383–9.
17. Behndig A, Montan P, Stenevi U, Kugelberg M, Lundström M. One million cataract surgeries: Swedish National Cataract Register 1992–2009. J Cataract Refract Surg 2011;37(8):1539–45.
18. Lewallen S, Roberts H, Hall A, Onyange R, Temba M, Banji J, et al. Increasing cataract surgery to meet Vision 2020 targets: experience from two rural programmes in east Africa. Br J Ophthalmol 2005;89(I):1237–40.
19. Hashemi H, Alipour F, Mehrvaran S, Rezvan F, Fotouhi A, Alaeddini F. Five year cataract surgical rate in Iran. Optom Vis Sci 2009;86:890Y4.
20. World Health Organisation. Global initiative for the elimination of avoidable blindness. Geneva, Switzerland. <http://whqlibdoc.who.int/hq/1997/WHO_PBL_97.61_Rev.1.pdf>.
21. Bamashmus M, Al-Akily S, Al-Barrag A. Human resources and infrastructure for eye care in Yemen: Current Status. Middle East J Ophthalmol 2006;13(4):154–7.
22. Mehari ZA, Zewedu RTH, Gulilat FB. Barriers to cataract surgical uptake in central Ethiopia. Middle East Afr J Ophthalmol 2013;20(1):229.
23. Yorston D. High-volume surgery in developing countries. Eye 2005;19:1083–9.
24. Coutts A, Stickler D, Batniji R, Ismail S, Mazik W, McKee M. The Arab Spring and health: two years on. Int J Health Serv 2013;43(1):49–60.
25. Saleh SS, Alameddine MS, Natafgi NM, Mataria A, Sabri B, Nasher J, et al. The path towards universal health coverage in the Arab uprising countries Tunisia, Egypt, Libya, and Yemen. Lancet 2014;383(368–368).
26. Rabiu MM, Al Rajhi A, Oureshi MB, Gersbeck J. Enhancing advocacy for eye care at national levels: What steps to take for the next decade? Middle East Afr J Ophthalmol 2012;19(1):75.
27. Melese M, Alemayehu W, Friedlander E, Courtright P. Indirect costs associated with accessing eye care services as a barrier to service use in Ethiopia. Trop Med Int Health 2004;9(3):426–31.