



Received: 06 April 2016
Accepted: 15 September 2016
Published: 17 November 2016

*Corresponding author: Ramyil AV,
Department of Ophthalmology, Jos
University Teaching Hospital, Jos,
Nigeria
E-mail: lauiya@yahoo.com

Reviewing editor:
Maren Klemm, Universitätsklinikum
Hamburg-Eppendorf, Germany

Additional information is available at
the end of the article

OPHTHALMOLOGY | RESEARCH ARTICLE

An assessment of trichiasis surgery workforce in Jigawa State, Nigeria

A.V. Ramyil^{1*}, C. Bascaran², Catey Bunce³, P. Wade¹, F. Oyediji¹ and C. Mpyet¹

Abstract: *Purpose:* To compare the trichiasis surgery workforce in Jigawa state with the World Health Organization recommendations for surgical technique, training and equipment supply; and to explore the self-reported challenges faced by the lid surgeons in the recruitment and management of trichiasis patients. *Methodology:* All available trichiasis surgeons in the state were given questionnaires to complete with information about their training, management of trichiasis, difficulties faced in their practice, surgical equipment; and perceived barriers to uptake of trichiasis surgery. *Results:* Fifteen surgeons evaluated, all were males with a mean age of 43.7 years (± 8.6 years), with an average of three surgeons per zone. Nine of the surgeons could perform both BLTR and Trabut operation, four could do only Trabut while two did only BLTR. All had formal training and certification, except two who trained on the job. Only surgeons whose first training was at least 8 years prior to the study had been retrained. There was an average of 1.66 (± 1.17) complete trichiasis surgery instrument sets per centre. Eight (53.33%) surgeons were satisfied with the number and quality of surgical sets. Self reported challenges faced by the surgeons were postoperative infection from poor hygiene, poor compliance with postoperative medications, lack of acceptance of surgery by patients, difficulty in accessing remote areas and sub-standard drugs. *Conclusion:* Staff training and

ABOUT THE AUTHORS

The authors are a group of professionals made up of Ophthalmologists and an Ophthalmic Statistician whose research interests are mainly centered around eye health particularly public health for eye care and ophthalmic statistics. Alice Ramyil and Caleb Mpyet are specifically interested in trachoma and trichiasis related research; as well as Caleb Mpyet being part of the ongoing Global Trachoma Mapping Project (GTMP).

PUBLIC INTEREST STATEMENT

Trachoma is the leading cause of blindness from an infectious agent worldwide.

Trichiasis a blinding form of the disease, is the in-turning of eyelashes which then rub on the eyeball causing blindness. This usually affect adults especially women.

The World Health Organization (WHO) has adopted the SAFE strategy (Surgery for Trichiasis, Antibiotics for active disease, Facial cleanliness and Environmental Improvement to reduce disease transmission) for the prevention and control of Trachoma. It has also recommended the training of non-ophthalmologists to carry out trichiasis surgery in resource-poor settings due to dearth of Ophthalmologists. In Jigawa state, ophthalmic nurses have been trained to carry out trichiasis surgery in order to reduce the burden of trichiasis in the state.

This study assesses the trichiasis surgeons and compares their training and equipment supply with the WHO recommended standard for trichiasis surgeons, with a view to improving quality and service delivery.

instrument supply fall short of the recommended for trichiasis surgeons. The challenges faced by TT surgeons in Jigawa are similar to those experienced by TT surgeons in other resource poor settings.

Subjects: Public Health-Medical Sociology; Public Health Policy and Practice; Ophthalmology

Keywords: assessment; trichiasis surgery; work force; Jigawa State; Nigeria

1. Introduction

In 1997, the World Health Organization (WHO) established the Alliance for Global Elimination of Trachoma by the year 2020. It also adopted the SAFE strategy for trachoma control (Surgery for trichiasis, Antibiotics, Facial cleanliness and Environmental change, such as clean water, latrines and good sanitation) (World Health Organization (WHO), 2006). Implementation of the SAFE strategy has brought about a reduction in the magnitude of active trachoma, although the magnitude of trichiasis has risen with resultant marked increase in the number of people at risk of blindness from the disease. There is therefore a need for concerted efforts to increase the number and quality of lid surgeries in endemic areas to deal with the backlog of the trichiasis cases requiring surgery and prevent the huge economic loss attributed to visual loss from trachoma (Buchan, Limburg, & Burton, 2011; Frick, Hanson, & Jacobson, 2003).

Among the many surgical techniques available for trichiasis, the WHO has recommended the Bilamellar Tarsal Rotation (BLTR) as the surgery of choice and alternatively the Posterior Lamellar Rotation (PLTR) in trachoma control programme settings (Solomon, 2006; Reacher, Foster, & Huber, 1993). The WHO has also recommended the training of non-ophthalmologists to carry out these surgeries in village/ community settings to improve the reach and uptake of trichiasis surgery, as most of those who require surgery live in remote and difficult to reach areas, coupled with the dearth of ophthalmologists in these resource poor countries (Solomon, 2006).

For trachoma control programmes, the WHO recommends at least two lid surgeons per centre operating at least once a week on specific days to avoid patients being turned back when a surgeon is unavailable due to ill-health, attending an outreach or other reasons (Solomon, 2006). It also recommends that each surgeon should be provided with two complete sets of instruments which need to be replaced at least every two years (Solomon, 2006).

Trichiasis surgeons just like other healthcare workers in the developing world face challenges in their work such as poor working and living conditions, lack of social amenities among others (Hongoro & McPake, 2004; Habtamu et al., 2011; Lewallen, Mahande, Tharaney, Katala, & Courtright, 2007; Rowe, de Savigny, Lanata, & Victora, 2005). Addressing these challenges is key to staff retention (Habtamu et al., 2011).

Jigawa state has a population of about 4.6 million people and 27 Local Government Areas. It is located in the North West geopolitical zone and borders Niger republic. The State lies within the Sudan Savannah with elements of Guinea Savannah in the south. It enjoys reasonably good inter-city roads but poor public transport systems. Over 90% of the population is rural and 80% agrarian.

The healthcare delivery system is structured in the form of district integrated health system known as the Gunduma health care delivery system which is subdivided into eight Gunduma (Districts). As a result, all health facilities come under a single delivery system to enhance service delivery and productivity. There are 2 tertiary health institutions, 12 General/District hospitals, 81 Primary Health Centres and numerous health posts. There are 5 fully equipped secondary eye care centres providing surgical services in the state, with 3 full time and 3 visiting ophthalmologists, 2 optometrists and 22 Ophthalmic Nurses (ON), 16 of whom are trained lid surgeons. There are also 58 trained primary eye care workers, 2,321 trained facility workers and volunteers involved in community distribution of Ivermectin. The healthcare as well as eye care in Jigawa state is financed by the

state government with support from Non-governmental Organizations such as Christoffel Blinden Mission (CBM), African Programme for Onchocerciasis Control and other corporate organizations.

The trachoma control programme in Jigawa state is supported by CBM through the CBM Vision 2020 support centre (now Health and Development Support/ HANDS) in Jos, Plateau state. The SAFE strategy in Jigawa state was instituted following the results of a trachoma rapid assessment and later a population based survey done in the state (Ramyil et al., 2015). Implementation started with the **S** component (surgery for trichiasis) in 2007 and later **A** (antibiotics-Azithromycin) distribution in 2011.

Lid surgery for trichiasis in the state is performed in different centres by the ophthalmic nurses trained as lid surgeons. Routine paid surgery is performed regularly at base hospitals. In addition to this, the state government and CBM organize 3–4 trachoma case finding campaigns annually during which patients are operated free of charge at either the base hospitals or health centres in the community and all patients are given free postoperative topical and oral antibiotics. Some corporate organizations and public-spirited individuals also sponsor free lid surgeries in zones or communities of their choice outside the routine campaigns.

The surgical procedure performed in the state is mainly the BLTR, although some surgeons prefer doing the PLTR (trabut) procedure. After surgery, the patient is given tetracycline eye ointment and capsules; lid sutures are removed between 1–2 weeks depending on the surgeon's preference. Routine follow-up is done at either the health centres or base hospitals.

Jigawa state has a high prevalence of trachoma there is also an established trachoma control programme which started with surgery for trichiasis (Ramyil et al., 2015). As a result of this, over 22,000 lid surgeries have been carried out by the lid surgeons. There is however no study to assess the training of these surgeons, their access to quality equipment and the difficulties they face in performing lid surgery in the state. This study aims specifically to compare the trichiasis surgery workforce in Jigawa state with the WHO recommendations for surgical technique, training and equipment supply; and to explore the self-reported challenges faced by the lid surgeons in Jigawa state in the recruitment and management of trichiasis patients. This information would help to improve service delivery for the trachoma control programme in Jigawa State and elsewhere.

2. Methodology

As part of the study on the outcome of trichiasis surgery and patient satisfaction with trichiasis surgery in Jigawa state (Ramyil et al., 2016), all available surgeons operating in the state were given questionnaires to complete with information about their training, management of trichiasis, difficulties faced in the management of patient with trichiasis, surgical equipment and supply; and perceived barriers to uptake of trichiasis surgery based on their experiences. The questionnaire was developed for the purpose of the study.

2.1. Data management and analysis

All data was double-entered into a pre-coded Microsoft Access database with consistency checks. All data entry was done by the researchers on an on-going basis throughout the survey period.

- Participants were identified by their unique Study identification numbers.
- Data analysis was done using STATA version 12.1 statistical software.

2.2. Ethical approval

Ethical Approval was obtained from the London School of Hygiene and Tropical Medicine Ethical Committee and the Operational Research Committee of the Jigawa state Ministry of Health.

Table 1. Number of retraining sessions by duration since first training

First training	Number retraining sessions				Total
	0	1	2	3	
No formal training	2	0	0	0	2
2 years	2	0	0	0	2
3 years	1	0	0	0	1
5 years	3	0	0	0	3
8 years	0	1	0	0	1
9 years	1	0	0	0	1
11 years	0	1	0	0	1
15 years	0	0	1	0	1
16 years	0	0	0	1	1
Total	9 (69.23%)	2 (15.38%)	1 (7.69%)	1 (7.69%)	13 (100)

3. Results

Of the 16 surgeons operating in the state 15 were evaluated, all were males, the only female surgeon was unavailable at the time of the study.

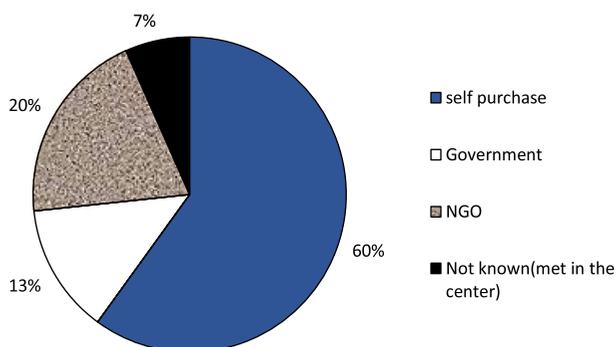
The mean age of the surgeons was 43.7 years (± 8.6 years). There was an average of three surgeons in each of the four zones with a range of 2–5. Nine of the surgeons could perform both BLTR and Trabut operation, four could do only Trabut while two did only BLTR. All the surgeons had formal training and certification, except two who were trained on the job at the centres where they operated. Only surgeons whose first training was at least 8 years prior to the study had been retrained. Table 1 shows frequency of retraining by duration since first training of 13 respondents (fisher’s exact $p = 0.02$).

All surgeons are involved in outreaches with an average of 63.12% ($\pm 15.33\%$; minimum 40%, maximum 90%) of the surgeries performed by each surgeon done during outreaches. The duration of follow-up was one month for 46.67% (7) of the surgeons, 2–3 months 26.67% (4), 6 months 6.67% (1) and case dependent 20% (3). There was an average of 1.66 (± 1.17 ; minimum 0, maximum 4) complete trichiasis surgery set per centre. Eight surgeons (53.33%) were satisfied with the number and quality of their surgical sets, while 7(46.67%) were not satisfied, satisfaction was not related to number of complete sets (fisher’s exact $p = 0.18$). Figure 1 shows the source of instruments. All surveyed believe that government and NGOs should assist in the supply of instruments.

The self reported challenges faced by the surgeons in the management of trichiasis patients were poor hygiene with postoperative infection, poor compliance with postoperative medications, lack of acceptance of surgery by patients, difficulty in accessing remote areas and sub-standard drugs.

The perceived barriers to acceptance of surgery as reported by surgeons were poverty, fear of pain, fear of the unknown, ignorance/ lack of awareness, fear of scar and non-acceptance of surgery during farming season for male patients.

Figure 1. Instrument source.



4. Discussion

The WHO recommends at least two surgeons per centre operating at least once a week on specific days to avoid patients being turned back when a surgeon is unavailable due to ill-health, attending and outreach or other reasons (Solomon, 2006). We found at least two surgeons per zone in this study, although some centres only had one surgeon while others had three or more. There is therefore a need for redistribution to enhance productivity and boost the morale of the surgeons. The self-reported availability of complete TT surgical sets falls far below the standard (Solomon, 2006), and in most cases they were self-purchased by the surgeons. Other studies also found inadequate/lack of instruments among lid surgeons in control programmes (Habtamu et al., 2011; Lewallen et al., 2007). Government and NGO support is needed in the provision of good quality surgical instruments in adequate numbers (at least two per surgeon); these instruments also need to be replaced at least every two years as recommended by the WHO (Solomon, 2006). This could also improve performance and job satisfaction with likely positive impact on surgeon retention and surgical outcome (Habtamu et al., 2011; Lewallen et al., 2007).

In this study, only surgeons whose first training was at least eight years prior to the study had ever been retrained; this is far from the recommended routine retraining (Solomon, 2006). The need for training, re-training and constant supervision of surgeons to ensure good outcome cannot be over-emphasized (Buchan et al., 2011; Solomon, 2006; Rowe et al., 2005). The self reported challenges faced by the surgeons in management of trichiasis patients were poor hygiene with recurrent post-op infection, poor compliance with post-operative medications, lack of acceptance of surgery by patients, difficulty in accessing some remote areas and sub-standard drugs. Addressing these challenges will impact positively on the retention and productivity of surgeons, for instance, access to good road and other social amenities have been associated with staff retention in a trachoma control programme (Habtamu et al., 2011).

The perceived barriers to acceptance of surgery as reported by surgeons were poverty, fear of pain, fear of the unknown, ignorance/lack of awareness, fear of scar and non-acceptance of surgery during farming season for male patients. A lack of awareness, cost, fear and traditional beliefs as perceived barriers have been reported by other surgeons (Habtamu et al., 2011; Lewallen et al., 2007). These are similar to factors reported by persons with trichiasis who are yet to present for, or accept surgery in other studies (Bowman et al., 2002; Habte, Gebre, Zerihun, & Assefa, 2008; Mahande et al., 2007; Rabi & Abiose, 2001). Efforts must be put in place to address these barriers in order to improve TT surgery uptake.

5. Conclusion

Staff training and instrument supply in Jigawa state fall short of the recommended for trichiasis surgeons in control programmes. The challenges faced by TT surgeons in Jigawa are similar to those experienced by TT surgeons in other resource poor settings. More effort is needed to mitigate these challenges and also improve on staff training and equipment supply in order to improve trichiasis service delivery.

Acknowledgement

The project was sponsored by the British Council for Prevention of Blindness (BCPB) and the Commonwealth Scholarship Commission (CSC). We are grateful to the survey team and the Jigawa State eye care team.

Funding

The authors received no direct funding for this research.

Competing Interests

The authors declare no competing interests.

Author details

A.V. Ramyil¹
E-mail: laijya@yahoo.com
ORCID ID: <http://orcid.org/0000-0002-7202-2730>
C. Bascaran²
E-mail: covadonga.bascaran@shstm.ac.uk

Catey Bunce³
E-mail: catey.bunce@kcl.ac.uk
P. Wade¹
E-mail: delsatpwade@yahoo.com
F. Oyediji¹
E-mail: funmiola5@yahoo.com
C. Mpyet¹
E-mail: mpyetc@yahoo.com

¹ Department of Ophthalmology, Jos University Teaching Hospital, Jos, Nigeria.

² Clinical Research Department, International Centre for Eye Health, London School of Hygiene and Tropical Medicine, London, UK.

³ Department of Medical statistics, King's college London, London, UK.

Citation information

Cite this article as: An assessment of trichiasis surgery workforce in Jigawa State, Nigeria, A.V. Ramyil, C. Bascaran, Catey Bunce, P. Wade, F. Oyediji & C. Mpyet, *Cogent Medicine* (2016), 3: 1259145.

References

- Bowman, R. J., Faal, H., Jatta, B., Myatt, M., Foster, A., Johnson, G. J., & Bailey, R. L. (2002). Longitudinal study of trichomatous trichiasis in The Gambia: barriers to acceptance of surgery. *Investigative Ophthalmology & Visual Science*, 43, 936–940.
- Buchan, J. C., Limburg, H., & Burton, M. J. (2011). Quality assurance in trichiasis surgery: a methodology. *British Journal of Ophthalmology*, 95, 331–334. <http://dx.doi.org/10.1136/bjo.2010.186197>
- Frick, K. D., Hanson, C. L., & Jacobson, G. A. (2003). Global burden of trachoma and economics of the disease. *The American Journal of Tropical Medicine and Hygiene*, 69, 1–10.
- Habtamu, E., Rajak, S. N., Gebre, T., Zerihun, M., Genet, A., Emerson, P. M., ... Schachter, J. (2011). Clearing the backlog: Trichiasis surgeon retention and productivity in Northern Ethiopia. *PLoS Neglected Tropical Diseases*, 5, e1014. <http://dx.doi.org/10.1371/journal.pntd.0001014>
- Habte, D., Gebre, T., Zerihun, M., & Assefa, Y. (2008). Determinants of uptake of surgical treatment for trichomatous trichiasis in North Ethiopia. *Ophthalmic Epidemiology*, 15, 328–333. <http://dx.doi.org/10.1080/09286580801974897>
- Hongoro, C., & McPake, B. (2004). How to bridge the gap in human resources for health. *The Lancet*, 364, 1451–1456. [http://dx.doi.org/10.1016/S0140-6736\(04\)17229-2](http://dx.doi.org/10.1016/S0140-6736(04)17229-2)
- Lewallen, S., Mahande, M., Tharaney, M., Katala, S., & Courtright, P. (2007). Surgery for trichomatous trichiasis: findings from a survey of trichiasis surgeons in Tanzania. *British Journal of Ophthalmology*, 91, 143–145. <http://dx.doi.org/10.1136/bjo.2006.102368>
- Mahande, M., Tharaney, M., Kirumbi, E., Ngirawamungu, E., Geneau, R., Tapert, L., & Courtright, P. (2007). Uptake of trichiasis surgical services in Tanzania through two village-based approaches. *British Journal of Ophthalmology*, 91, 139–142. <http://dx.doi.org/10.1136/bjo.2006.103374>
- Rabiul, M. M., & Abiose, A. (2001). Magnitude of trachoma and barriers to uptake of lid surgery in a rural community of northern Nigeria. *Ophthalmic Epidemiology*, 8, 181–190. <http://dx.doi.org/10.1076/opep.8.2.181.4167>
- Ramyil, A., Bascaran, C., Bunce, C., Alada, J., Wade, P., & Mpyet, C. (2016). Outcome of trachoma lid surgeries in Jigawa state, Nigeria. *Cogent Medicine*, 3(1), 1233683.
- Ramyil, A., Wade, P., Ogoshi, C., Goyol, M., Adenuga, O., Dami, N., ... Mpyet, C. (2015). Prevalence of Trachoma in Jigawa State, Northwestern Nigeria. *Ophthalmic Epidemiology*, 22, 184–189. <http://dx.doi.org/10.3109/09286586.2015.1037399>
- Reacher, M., Foster, A., & Huber, J. (1993). *Trichiasis surgery for trachoma—The bilamellar tarsal rotation procedure*. Geneva: World Health Organization. WHO/PBL/93.29; 2011.
- Rowe, A. K., de Savigny, D., Lanata, C. F., & Victora, C. G. (2005). How can we achieve and maintain high-quality performance of health workers in low-resource settings? *The Lancet*, 366, 1026–1035. [http://dx.doi.org/10.1016/S0140-6736\(05\)67028-6](http://dx.doi.org/10.1016/S0140-6736(05)67028-6)
- Solomon, A. W. (2006). *Trachoma control: A guide for programme managers*. Geneva: World Health Organization.
- World Health Organization. (2006). *Global elimination of blinding trachoma [resolution WHA 51.11 adopted by the World Health Assembly, 16 May 1998]*. Geneva: Author.



© 2016 The Author(s). This open access article is distributed under a Creative Commons Attribution (CC-BY) 4.0 license.

You are free to:

- Share — copy and redistribute the material in any medium or format
 - Adapt — remix, transform, and build upon the material for any purpose, even commercially.
- The licensor cannot revoke these freedoms as long as you follow the license terms.

Under the following terms:

- Attribution — You must give appropriate credit, provide a link to the license, and indicate if changes were made. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.
- No additional restrictions

You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits.



Cogent Medicine (ISSN: 2331-205X) is published by Cogent OA, part of Taylor & Francis Group.

Publishing with Cogent OA ensures:

- Immediate, universal access to your article on publication
- High visibility and discoverability via the Cogent OA website as well as Taylor & Francis Online
- Download and citation statistics for your article
- Rapid online publication
- Input from, and dialog with, expert editors and editorial boards
- Retention of full copyright of your article
- Guaranteed legacy preservation of your article
- Discounts and waivers for authors in developing regions

Submit your manuscript to a Cogent OA journal at www.CogentOA.com

