CLINICAL INVESTIGATION

EDITORIAL

Clin. Invest. (2013) 3(12), 1101–1103

A close look at trachoma control and the challenges that district programs pose

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"Despite challenges that trachoma programs face in implementing the multifaceted strategy at district level, there is evidence that it works..."

Trachoma, the leading infectious cause of blindness, is caused by repeated episodes of infection with *Chlamydia trachomatis,* requiring an environment that facilitates transmission [1]. Trachoma affects an estimated 40 million people worldwide, with 7.6 million blind or severely visually impaired [1]. The productivity loss from visual impairment due to trachoma is estimated at US$5.3 billion [2].

The community pool of active trachoma and infection resides in children. Multiple infections are followed by scarring of the conjunctiva, which may progress to cause entropion and trichiasis, or inturned eyelashes that, if not surgically corrected, lead to corneal damage and vision loss in older ages. There is currently no treatment for corneal opacification, nor interventions to halt the scarring process.

The WHO recommends a multifaceted 'SAFE' strategy for trachoma control: Surgery for trichiasis (S); Antibiotics to treat the community pool of infection (A); Face washing (F); and Environmental change to sustain reduction in transmission (E). The WHO recommends mass drug administration (MDA) with antibiotics, preferably azithromycin, when the prevalence of follicular trachoma is more than 10% in children aged 1–9 years at the district level [3]. The SAFE strategy is implemented on a district-wide basis.

The Ultimate Intervention Goal for trichiasis is district prevalence of <1/1000 population, and for active trachoma, a prevalence of follicular trachoma <5% in children aged 1–9 years [3]. WHO guidelines suggest that annual MDA be provided for all communities in a district for at least 3–5 years before any expectation of significant change [3].

The district is the implementation unit of the control strategy, and this poses unique challenges for a disease program because it is largely not based on 'case finding' but implementation of an intervention at a population level. While this approach is not unique to trachoma, there are lessons from the experience with trachoma programs for other programs. This editorial describes some challenges and experiences.

Challenge one: defining the population at risk

Simply put, the target population is the population of an endemic district. However, because SAFE is a multifaceted strategy, it is directed at different populations within the district. In most endemic communities, cases of trichiasis are middle-aged and older and a greater proportion are women than men [4]. Thus, case-finding strategies for the provision of surgical services need to ensure they reach adult

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Keywords: *Chlamydia trachomatis* • district • mass drug administration • ocular • population based • trachoma

women. However, for active trachoma and infection, children are the primary reservoir, especially preschool-aged children [4]. MDA is provided to the whole community, and coverage is estimated at the population level, but efforts to ensure high coverage of children is critical for success over time. The implementation of F and E programs involves understanding the cultural complexity of families within communities and, because the programs are so varied, the target population of interest is program specific. For example, addressing the improvement of facial cleanliness in children seems, superficially, a program directed at mothers to use water for washing; in reality, the decision to use a potentially scarce resource, water, for washing can involve the men as head of households as well as the support of the community [5].

Challenge two (S): the use of district static surgery services for morbidity management

In many endemic trachoma countries, eye nurses are trained to provide trichiasis surgery and outcomes are comparable to ophthalmologists [6]. They are often deployed to the districts to provide primary eye care, including trichiasis surgery. They are placed in district hospitals or district health facilities, which may be several hundred kilometers from the communities they serve, and there are no resources provided to undertake local screening or case finding.

In large part, this framework has not proven successful in achieving the numbers of surgeries needed. First, people do not come for surgery, as it is too far [7]. However, bringing the local surgeon to the community is not efficient, as an entire day is used to perform just a few operations. Second, if few operations are performed each year, the surgeon loses his/her skill and patients are at increased risk of poor outcomes. Great variability is seen in recurrent trichiasis among surgeons [8,9], and poor outcomes provide negative incentives to others in the community.

One answer may well be for national programs to organize community-based screening and traveling camps of excellent surgeons who cover the districts on a rotating basis. This approach will be costly, yet will help address the back log of trichiasis surgery cases. This vertical approach does raise concerns that the problem of surgery for future incident trichiasis cases is not being addressed.

Challenge three (A): planning & estimating the need for azithromycin

Projecting the antibiotic needs for the district can be a difficult challenge, especially with the expectation of donors that high coverage should be achieved. Planners may have old census, or inaccurate census data, and therefore run the risk of too little or excess antibiotic. For some countries, the 'official' census may be inflated for political reasons, leading to a constant perception by donors of poor coverage when the reality is reasonable coverage.

National programs are often in the position of juggling in-country supplies around districts that may need more or less than projected in the past, to ensure that supplies that are sitting in districts unused do not expire.

This is not unique to trachoma control programs and suggests building the capacity of supply chain managers from the national level down to the district and community level.

Challenge four (A): implementation of MDA at district level

A significant challenge in delivering SAFE at the district level is the implementation of MDA to the communities. Some of the issues include:

- Constructing a distribution strategy for annual treatment. In Ethiopia, some regions hold a combined malaria and trachoma week wherein azithromycin is distributed along with long-lasting insecticidal nets, health education and malaria testing and treatment. In Tanzania, some districts train community treatment assistants who gather census data, advertise the availability of azithromycin and set up distribution points at several places in their community over a period of a few days to a week. Modest payment after MDA is provided to ensure high coverage.
- Measuring coverage. Currently, 100% annual population coverage is the ideal, and at least 80% is probably needed to sustain reductions in infection over time [10,11]. However, in program settings, coverage may be significantly lower than 80%. The critical coverage estimate is the percentage of children who received MDA, as rates of infection and disease in adults are very low if present at all [12]. Program success for active trachoma will depend on high coverage in children, yet coverage in this group is not monitored.

Challenge five (F & E): need for efforts to sustain reduced transmission

Trachoma disappeared in Europe and the USA prior to the advent of antibiotics, through socioeconomic development. There is strong feeling that without the 'F and E' components, trachoma will re-emerge once antibiotic pressure is removed and there is some support for that concern [11]. Mobilizing resources to improve facial hygiene and environmental changes is a formidable undertaking and not one usually carried out by Ministries of Health, who typically have the trachoma program

in their portfolio. At district level, this may prove even more challenging, as the water and sanitation staff may have their priorities set at the national level. Nevertheless, the district health and water and sanitation teams should be in communication to facilitate this necessary component of trachoma control for their districts.

Conclusion

Despite challenges that trachoma programs face in implementing the multifaceted strategy at district level, there is evidence that it works [13] and several countries are now ready to declare the achievement of elimination goals, with others projected in advance of 2020. With considerable funding coming in for further scale-up, there will be numerous opportunities to continue to learn from trachoma control programs.

Financial & competing interests disclosure

This work was supported by grant U10EY022584 from the National Eye Institute. The author serves as a technical advisor to the International Trachoma Initiative. The author has no other relevant affiliations or financial involvement with any organization or entity with a financial interest in or financial conflict with the subject matter or materials discussed in the manuscript apart from those disclosed.

No writing assistance was utilized in the production of this manuscript.

References

1 Mariotti SP, Pascolini D, Rose-Nussbaumer J. Trachoma: global magnitude of a preventable cause of blindness. *Br. J. Ophthalmol.* 93(5), 563–568 (2009).

2 Frick KD, Basilion EV, Hanson CL, Colchero MA. Estimating the burden and economic impact of trachomatous visual loss. *Ophthalmic Epidemiol.* 10(2), 121–132 (2003).

3 WHO. Third Global Scientific Meeting on Trachoma. Baltimore, MD, USA, 19–20 July 2010.

4 West SK, Munoz B, Turner VM, Mmbaga BBO, Taylor HR. The epidemiology of trachoma in central Tanzania. *Int. J. Epidemiol.* 20, 1088–1092 (1991).

5 Mccauley AP, West S, Lynch M. Household decisions among the Gogo people of Tanzania: determining the roles of men, women and the community in implementing a trachoma prevention program. *Soc. Sci. Med.* 34(7), 817–824 (1992).

6 Alemayehu W, Melese M, Bejiga A, Worku A, Kebede W, Fantaye D. Surgery for trichiasis by ophthalmologists versus integrated eye care workers: a randomized trial. *Ophthalmology* 111(3), 578–584 (2004).

7 Oliva MS, Munoz B, Lynch M, Mkocha H, West SK. Evaluation of barriers to surgical compliance in the treatment of trichiasis. *Int. Ophthalmol.* 21(4), 235–241 (1997).

8 West ES, Mkocha H, Munoz B *et al.* Risk factors for postsurgical trichiasis recurrence in a trachoma-endemic area. *Invest. Ophthalmol. Vis. Sci.* 46(2), 447–453 (2005).

9 Burton MJ, Kinteh F, Jallow O *et al.* A randomised controlled trial of azithromycin following surgery for trachomatous trichiasis in the Gambia. *Br. J. Ophthalmol.* 89(10), 1282–1288 (2005).

10 West SK, Bailey R, Munoz B *et al.* A randomized trial of two coverage targets for mass treatment with azithromycin for trachoma. *PLoS Negl. Trop. Dis.* 7(8), e2415 (2013).

11 Lakew T, House J, Hong KC *et al.* Reduction and return of infectious trachoma in severely affected communities in ethiopia. *PLoS. Negl. Trop. Dis.* 3(2), e376 (2009).

12 Solomon AW, Holland MJ, Burton MJ *et al.* Strategies for control of trachoma: observational study with quantitative PCR. *Lancet* 362(9379), 198–204 (2003).

13 Ngondi J, Onsarigo A, Matthews F *et al.* Effect of 3 years of SAFE (surgery, antibiotics, facial cleanliness, and environmental change) strategy for trachoma control in southern Sudan: a cross-sectional study. *Lancet* 368(9535), 589–595 (2006).