

Trachoma in Turkey and Australia-a Tale of Two Countries

Türkiye ve Avustralya'da Trahom-İki Ülkenin Hikayesi

Alp Atik

Medical Teaching and Administration Unit, Royal Prince Alfred Hospital, University of Sydney, Sydney, Australia

Summary

Trachoma is the leading cause of infectious blindness worldwide, afflicting some of the poorest regions of the globe. Turkey is currently seventy-ninth in the United Nations' Human Development Index (HDI), a composite statistic used to rank countries by level of development according to life expectancy, education and gross domestic product. Despite limited resources, it has been relatively successful in eradicating trachoma from its population. While trachoma was an endemic disease upon the formation of the Turkish Republic, with a prevalence rate of up to 70% in the south-east, a comprehensive national health program involving community monitoring and treatment saw the prevalence of trachoma fall to around 2% in the 1970s. In contrast, Australia, which ranks second in the HDI, is the only developed country in the world, where blinding trachoma prevails. The disease primarily affects the impoverished Aboriginal population and is as staggeringly high as it was 30 years ago, with a prevalence of 40% in some regions. The success of the Turkish campaign against trachoma was driven by the "Trachoma Fighting Organization", a national program, which coordinated multiple inter-related strategies to counter trachoma. The success of this program has been consolidated by the implementation of initiatives such as the Southeastern Anatolian Project, which has ensured socioeconomic development and sustenance of basic amenities like fresh water to the population. Australia's trachoma control efforts have thus far been patchy and inconsistent, with no national program to counter or monitor the disease until 2006. This is exacerbated by the fact that remote Aboriginal areas provide an ideal milieu for spread of infection with hot, dusty climates and profound material poverty. The Turkish experience with trachoma may be utilised as a model for the urgent and sustained public health interventions required in Australia to address the socioeconomic deprivation perpetuating this preventable disease. (*TJO 2010; 40: 300-3*)

Key Words: Trachoma, Turkey, Australia, infection, ocular, treatment, investigation, epidemiology

Özet

Trahom, dünya'da bulaşıcı körlüğe en fazla neden olan ve en fakir bölgeleri etkileyen bir hastalıktır. Türkiye, Birleşmiş Milletler İnsani Gelişme Endeksi'ne göre, dünyanın gelişmiş 79. ülkesidir. Söz konusu endeks, ortalama yaşam süresi, eğitim seviyesi ve gayrisafi yurtiçi hasıla gibi insani gelişimi ölçen değişkenler ile oluşturulmuştur. Kısıtlı kaynaklarına rağmen, Türkiye trahom tedavisinde yüksek başarı elde etmiştir. Cumhuriyet'in kuruluşunda, özellikle Güneydoğu Anadolu'da evrensel ve endemik bir hastalık olan trahom, yaygın olduğu bölgelerdeki nüfusun %70'inde görülmekte iken, bu oran 1970'li yıllarda %2 seviyesine kadar düşmüştür. Avustralya ise Birleşmiş Milletler İnsani Gelişme Endeksi'ne göre dünyanın ikinci gelişmiş ülkesi olmasına rağmen, benzer gelişmişlik düzeyinde yer alan ülkeler içerisinde trahom hastalığından kaynaklanan körlük gözlemlenen tek ülkedir. Özellikle Aborjin toplumunda hastalığın oranı son 30 yıldır değişmemiş ve bazı bölgelerde %40'a ulaşmıştır. Türkiye'nin trahom ile mücadelesindeki başarısının en önemli nedeni olarak "Trahom Mücadele Teşkilatı" (TMT) görülmektedir. TMT hastahane, dispanser ve köy tedavi evlerinin sayısını yıldan yıla arttırarak, etkin bir şekilde hasta taraması ve tedavisi uygulamıştır. Söz konusu teşkilatın başarısı sosyoekonomik kalkınma ve insanların kullanımına bol miktarda temiz su sağlayan Gündeydoğu Anadolu Projesi gibi ulusal programlarla pekiştirilmiştir. Buna karşılık 2006 yılına kadar ulusal bir tedavi kampanyası dahi uygulanmayan Avustralya'da hastalık ile mücadele etkisiz ve yetersiz kalmıştır. Bu sorun Avustralya'daki Aborjinlerin ülkenin en fakir, en sıcak ve hastalığın yayılması için en ideal ortamlarda yaşamlarını sürdürmelerinden şiddetlenmektedir. Nitekim Türkiye'nin yürütmüş olduğu trahom ile mücadele programı, Avustralya'nın sosyoekonomik problemlerini aşması için gerekli olan acil ve kalıcı halk sağlık müdahalesine bir örnek model olarak kullanılabilir. Aksi taktirde, dünyanın ikinci gelişmiş ülkesindeki bu acı gerçek daha da kötü bir hal alabilir. (*TJO 2010; 40: 300-3*)

Anahtar Kelimeler: Trahom, Türkiye, Avustralya, enfeksiyon, okular, tedavi, tarama, epidemiyoloji

Address for Correspondence / Yazışma Adresi: Alp Atik MD, Missenden Rd, Camperdown 2050 Sydney, Australia
Phonel.: +61413999636 E-mail: aatik@med.usyd.edu.au **Received/Geliş Tarihi:** 24.05.2010 **Kabul Tarihi/Accepted:** 26.06.2010

Login

Trachoma is the leading cause of infectious blindness worldwide (1). It afflicts some of the poorest regions of the globe as it is highly correlated with poverty, lack of hygiene and limited access to water. Turkey currently ranks seventy-nine in the United Nations' Human Development Index (HDI), a composite statistic used to rank countries by level of development according to life expectancy, education and gross domestic product. Despite limited resources, it has been relatively successful in eradicating trachoma from its population, with an effective and coordinated treatment program that has reduced the prevalence of trachoma in the poorest regions of the country to 1.7% (2). Australia is the second most developed country in the world according to the HDI (3). However, despite its evanescence from the rest of the developed world, trachoma still prevails in Australia, causing blindness to a considerable part of the population, with prevalence rates as high as 40% in some regions (4).

Trachoma is a form of keratoconjunctivitis initiated in early childhood by repeat infection of the ocular surface with the Gram-negative bacteria *Chlamydia trachomatis* (5,6). These episodes elicit a recurrent chronic inflammatory response, which progresses to scarring of the tarsal conjunctiva (5,7). Significant scarring contracts the tarsal conjunctiva, causing entropion and subsequent trichiasis (8). Associated with this are other alterations of the eye such as lacrimal function and corneal limbus. These changes eventually combine to damage the cornea, causing severe pain, corneal opacity and subsequently blindness (5,8).

Trachoma is a global problem. It is the third most common cause of blindness in the world, behind cataract and glaucoma (1). The World Health Organization (WHO) estimates that there are 84 million people suffering from active trachoma with 8 million either blind or severely visually impaired and more than 150 million in need of treatment (7,9). Overall, trachoma is estimated to affect approximately 10 percent of the world's population (10). The majority of those affected by trachoma live in underdeveloped parts of the world, as the disease correlates with poverty, lack of personal and community hygiene and limited access to healthcare and water (6,11). In a vicious cycle, the development of trachoma results in an estimated \$2.9 billion in lost global productivity per annum (12), which further exacerbates poverty and provides an additional socioeconomic burden to already strained communities.

In 1997, WHO established the Alliance for Global Elimination of Trachoma by the Year 2020 (GET2020) (13). The strategy uses the acronym SAFE for four inter-related public health interventions: surgery for trichiasis, antibiotics (azithromycin) for active trachoma, facial cleanliness (to reduce transmission) and environmental improvements (to upgrade community hygiene and living conditions) (14,15). The strategy employs prophylactic primary health care to reduce the reservoir of infection with antimicrobial therapy and aims to decrease infection transmission rates with facial cleanliness augmented with environmental improvements. The SAFE strategy has been shown to be an effective tool for reducing the blinding complications of trachoma (16). In 1995, 7 million people were estimated to be blind as a result of trachoma (17), and this was reduced to 1.3 million in 2002 (1).

Currently, the prevalence of trachoma in Turkey is 1.7% (2). However, upon the formation of the Turkish Republic, trachoma was an endemic disease with a prevalence rate of up to 70% in the south-east (18). Despite causing blindness and associated morbidity to a significant part of the population, it had been unrecognized and untreated by the Ottoman government. Thereafter, a comprehensive national health program involving effective community monitoring and treatment saw the prevalence of active trachoma in Turkey fall to around 2%, and blinding trachoma to 0.3% in the 1970s (19). The effectiveness of this campaign was driven by the formation of the "Trachoma Fighting Organization" (TFO), which was formed in the 1930s and coordinated efforts against trachoma on a national scale. The TFO increased the number of hospitals, dispensaries and village treatment houses in Turkey. In addition, high-risk areas with crowding, such as hospitals, military camps and schools, were targeted for the early diagnosis and treatment of the disease to prevent its spread. A national register was created, which recorded patient details and treatment protocols for all diagnosed patients, while an education campaign with information sessions and brochures was initiated to acquaint the general public with the disease and its sequelae.

The pillar of the long-term control of trachoma in Turkey lay in the prophylactic and treatment campaigns implemented at the school level. Every school in Turkey required annual monitoring of students, the quarantine of infected students at high risk of transmission and continuous education. In fact, in the decade between 1939 and 1949, the prevalence of trachoma in Turkish schools was reduced from 21.4% to 8.4% (20). This prevented the perpetuation of disease through generations

and the socioeconomic burden, which cyclically drove the vicious relationship between poverty and disease. This campaign was so effective that in 1954 the incidence and prevalence of trachoma in Turkey began to fall.

The reduction in trachoma spread was also associated with a greater focus on the poorer rural areas of Turkey, which were a haven for trachoma transmission. Some regions such as Adiyaman had a trachoma prevalence rate of 70-80% (18) and suffered greatly from its associated socioeconomic burden. As a result, village treatment houses were established in 1960, which were visited by medical officers at least once a fortnight and identified patients requiring treatment to be transferred to regional trachoma-specific hospitals. In addition, there were 'mobile groups' travelling on horseback, which circulated through villages in specified provinces. By the end of 1961, there were already 6 major and 52 regional trachoma-specific hospitals as well as 305 village treatment houses in Turkey (21). The campaign was so successful that by the 1970s, the prevalence of trachoma in Turkey was only 2% (19). This outcome was consolidated by the implementation of the Southeastern Anatolian Project ('Güneydoğu Anadolu Projesi'), which ensured socioeconomic development and sustenance of basic amenities such as fresh water to the population.

Despite limited resources and personnel, the successful coordination of a national program against trachoma in Turkey is in stark contrast to the Australian experience, where trachoma still persists at an endemic rate in remote Indigenous areas (22,23). Australia is the only developed country in the world, whose population still suffers from blinding trachoma (4), with prevalence rates as high as 40% in certain regions (24). Despite improvements in other areas of health, the incidence of trachoma in Aboriginal communities remains as staggeringly high as it was 30 years ago. In fact, approximately 20,000 Indigenous Australian children, some as young as one, still suffer from the disease (23).

The core axiom is that remote Aboriginal areas provide an ideal milieu for spread of infection with hot, dusty climates and profound material poverty (25). Trachoma was eliminated from Australia's non-Indigenous population by the 1930s as housing, hygiene and living conditions improved (22). However, in some areas of Australia, half of the Indigenous people do not have adequate housing and one in six communities do not have potable water (26).

Secondly, Australia's trachoma control efforts have thus far been patchy and inconsistent. For example, the implementation of the WHO's SAFE strategy has been delayed and ineffective (27).

Thirdly, until the establishment of the National Trachoma Surveillance and Reporting Unit in 2006, epidemiological data on trachoma, an essential element of any control program, was difficult to obtain and interpret. Each trachoma control program had its own data collection system and data from different regions and states were not collated (28). Even today trachoma is not a nationally notifiable disease (29) and there is dispute regarding the extent of transmission.

As a result of the above factors and despite the decade-long availability of a highly effective, single-dose treatment (azithromycin) provided without cost through remote Indigenous health clinics and regional population health units, trachoma transmission in Australia continues (28).

To counter the inefficacy of trachoma control, the Australian government formulated the first guidelines for the public health management of trachoma in Australia in 2006 (30). These guidelines, which outlined trachoma screening, control and data collection, were modelled on the SAFE strategy and modified to reflect the Australian experience. Trachoma control became the responsibility of government-run regional population health units, working with primary health care services and Aboriginal community representatives. Nevertheless, the campaign is yet to prove successful, with 14% of children examined in Aboriginal communities the following year still afflicted by trachoma (31). In fact, the disease was endemic in 65 of 123 communities examined, and in more than half of these, greater than 50% of children were affected. Of greater concern was that most communities reported an absence of organized attempts to control trachoma-more than half of the children diagnosed with trachoma were not subsequently provided with antibiotic treatment. A follow-up report found that the prevalence of unoperated trichiasis in Australia was more than four times the acceptable threshold set by the WHO (23).

Trachoma is a treatable and preventable condition, which causes a great deal of suffering worldwide. However, the conditions that are both a cause and outcome of the disease are completely avoidable. Australia is the only developed country in the world, where blinding trachoma persists. In fact, in some Australian Aboriginal communities, the disease is so common that blindness from trachoma is accepted as a fact of life (10). Australia's trachoma control programs to date have been ineffective at even reducing the prevalence of disease. In contrast, Turkey, which ranks seventy-two places below Australia in the HDI, has been relatively successful in eradicating trachoma from

its population. This is more marked in light of the fact that the two countries actually share similarities in rural infrastructure and urbanizations. The Turkish success in reducing trachoma has been primarily due to an effective and coordinated national treatment program aimed at prevention of transmission, improvement of basic living conditions and education of the population. This national program may be utilized as a model for the urgent and sustained public health interventions required in Australia to address the socioeconomic deprivation perpetually impelling trachoma. It is remarkable that despite its resources, the prevalence rates and suffering currently being seen in the second most developed country in the world are the same as those seen in the days of the Ottoman Empire a century ago.

References

- Resnikoff S, Pascolini D, Etya'ale D et al. Global data on visual impairment in the year 2002. *Bulletin of the World Health Organization*. 2004;82:844-51. [Full Text] / [PDF]
- Guraksin A, Gullulu G. Prevalence of Trachoma in Eastern Turkey. *International Journal of Epidemiology*. 1997;26:436-42. [Abstract] / [PDF]
- Klugman J, Rodriguez FR, Azcona G et al. Human Development Report 2009 Overcoming barriers: Human mobility and development. New York City: United Nations Development Program 2009.
- Polack S, Brooker S, Kuper H, Mariotti S, Mabey D, Foster A. Mapping the global distribution of trachoma. *Bulletin of the World Health Organization*. 2005;83:913-9. [Full Text] / [PDF]
- Wright HR, Turner A, Taylor HR. Trachoma and poverty: unnecessary blindness further disadvantages the poorest people in the poorest countries. *Clin Exp Optom*. 2007;90:422-8. [Abstract] / [Full Text] / [PDF]
- Sirmatel F, Oguz H. Prevalence of Chlamydia trachomatis pooled serotypes BDE and FGK in children with chronic follicular conjunctivitis. *Jpn J Ophthalmol*. 2000;44:467-9. [Abstract]
- Burton MJ. Trachoma: an overview. *British medical bulletin*. 2007;84:99-116. [Abstract]
- Wright HR, Turner A, Taylor HR. Trachoma. *Lancet*. 2008;371:1945-54. [Abstract] / [Full Text] / [PDF]
- World Health Organisation. Report of the 2nd Global Scientific Meeting on Trachoma. Geneva: World Health Organisation, 2003 25-27 August 2003 Contract No:10. [PDF]
- The Eye Foundation. Trachoma. Sydney: Mediapod; 2009 [cited 2009 18/7/2009]; Available from: http://www.eyefoundation.org.au/index.php?option=com_content&task=view&id=293&Itemid=103.
- Mariotti SP, Pascolini D, Rose-Nussbaumer J. Trachoma: global magnitude of a preventable cause of blindness. *The British journal of ophthalmology*. 2009;93:563-8. [Abstract] / [Full Text] / [PDF]
- Frick KD, Basilion EV, Hanson CL, Colchero MA. Estimating the burden and economic impact of trachomatous visual loss. *Ophthalmic epidemiology*. 2003;10:121-32. [Abstract]
- Organisation WH. Planning for the global elimination of trachoma (GET). Report of a WHO consultation. Geneva: World Health Organisation 1997 25-26 November 1996 Contract No.: WHO/PBL/97.60.
- Mabey DC, Solomon AW, Foster A. Trachoma. *Lancet*. 2003;362:223-9. [Abstract] / [Full Text] / [PDF]
- Mariotti S, Pruss A. The SAFE strategy. Preventing trachoma: a guide for environmental sanitation and improved hygiene. Geneva: WHO2001 Contract No.: WHO/PBD/GET/00.7/rev.1.
- Kuper H, Solomon AW, Buchan J, Zondervan M, Foster A, Mabey D. A critical review of the SAFE strategy for the prevention of blinding trachoma. *The Lancet infectious diseases*. 2003;3:372-81. [Abstract] / [Full Text] / [PDF]
- Thylefors B, Negrel AD, Pararajasegaram R, Dadzie KY. Global data on blindness. *Bulletin of the World Health Organization*. 1995;73:115-21. [Abstract] / [PDF]
- Hot I. Ulkemizde Trachom ile Mucadele. *Türk Klinikleri Tıp Etiği, Hukuku, Tarihi*. 2003;11:22-9. [Abstract] / [Full Text]
- Saglik ve Sosyal Yardim Bakanlığı. Saglik Hizmetlerinde 50 Yil. Ankara: Saglik ve Sosyal Yardim Bakanligi 1973.
- Bilgen I. Adana Okullarında Trachom Savasi. *Saglik Dergisi*. 1950;24:523-32.
- Uner R. Türkiye'de Saglik Hizmetleri. *Saglik Dergisi*. 1961;35:6-11.
- Taylor HR. Trachoma in Australia. *Med J Aust*. 2001;175:371-2. [Full Text]
- Roper K, Michel CE, Kelly PM, Taylor HR. Prevalence of trachoma in Aboriginal communities in the Katherine Region of the Northern Territory in 2007. *The Medical journal of Australia*. 2008;189:409. [Abstract]
- Ewald DP, Hall GV, Franks CC. An evaluation of a SAFE-style trachoma control program in Central Australia. *The Medical journal of Australia*. 2003;178:65-8. [Abstract]
- Taylor HR. Eye health in Aboriginal and Torres Strait Islander communities. Report of a review commissioned by the Commonwealth Minister for Health and Family Services, the Hon Dr Michael Wooldridge. Canberra: Commonwealth of Australia 1997.
- Australian and Torres Strait Islander Commission. Water: a report on the provision of water and sanitation in remote Aboriginal and Torres Strait Islander communities. Canberra: AGPS 1994.
- Taylor V, Ewald DP, Liddle H, Warchivker I. Review of the implementation of the National Aboriginal and Torres Strait Islander Eye Health Program Canberra: Commonwealth of Australia 2003.
- Mak DB. Better late than never: a national approach to trachoma control. *The Medical journal of Australia*. [Editorial]. 2006;184:487-8. [Abstract]
- Communicable Diseases Network Australia. Surveillance Case Definitions for the Australian National Notifiable Diseases Surveillance System. Canberra: Australian Government Department of Health and Ageing 2009. [Abstract]
- Communicable Diseases Network Australia. Guidelines for the public health management of trachoma in Australia Canberra: Commonwealth of Australia. 2006. [Abstract]
- Tellis B, Keefe JE, Taylor HR. Trachoma surveillance annual report, 2007. A report by the National Trachoma Surveillance and Reporting Unit. *Communicable diseases intelligence*. 2008;32:388-99. [Abstract]