Does fragmented implementation of the SAFE strategy (surgery, antibiotics, face washing, environmental improvements) reduce the prevalence of active trachoma infections among children aged 0-9 years?

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INTRODUCTION

- Trachoma is the leading cause of infectious blindness and affects more than 80 million people worldwide.
- An estimated 2.2 million develop visual impairment as a result of the disease, of whom 1.2 million continue to develop irreversible blindness.1

METHODS & PICO QUESTION

- A literature review was performed using PubMed to search for studies that evaluated the effectiveness of at least one component of the SAFE strategy in reducing trachoma-induced blindness.
- The search term (trachoma) was used in combination with the following modifying terms:
  - (SAFE) or (antibiotics)
  - (hygiene) or (race washing)
  - (blindness) or (environmental improvements)
- Results were limited to studies published in English, available in full text, publication dates within the last 5 years, and studies with human species.
- Of 244 references meeting our search criteria, 6 references were further reviewed to ensure that the data addressed our research question:
  - Population: children aged 0-9 years
  - Intervention: Implementation of all 4 components of the SAFE strategy
  - Comparison: Implementation of any component(s) of the SAFE strategy
  - Outcomes: Trachoma prevalence (secondary: trachoma recurrence, blindness)

RESULTS

- High rates of trachoma recurrence were found within years in every study that did not implement all four components of the SAFE strategy.6
- Surgery implemented alone was shown to significantly improve visual acuity.2
- Azithromycin implemented alone was found to have a relative risk reduction of 20%. This observed benefit is negatively impacted due to sources of reinfection, such as individuals in the community who do not participate in the mass treatments and spread of infection to neighboring regions.2,3
- Causally between face washing alone and reduction in the prevalence of trachoma infection is not established. However, implementation of water, sanitation, and hygiene interventions were strongly associated with reduced prevalence of active trachoma.4
- Environmental improvement implemented alone showed inconsistent and varied results.3
- Individual SAFE components do not have consistent implementation protocols which leads to inconsistencies in data and unreliable recommendations.2
- Implementation of all components of the SAFE strategy showed the greatest decrease in prevalence of trachoma and appear to hold the most potential for long-term rates of non-significant reductions of disease.3,6

CONCLUSION & DISCUSSION

- Trachoma treatments have largely been ineffective in the past due to high rates of surgical failure, non-adherence to antibiotics, and ineffective sanitary educational campaigns.2,6
- The prevalence of reinfection and re-infection have been shown to decrease when surgery/antibiotics are combined with face washing and environmental interventions (i.e. implementation of all components of the SAFE strategy).2
- The SAFE strategy has shown potential to eliminate trachoma if implemented concurrently and for a minimum of five years.3
- A continued effort must be made after this time to decrease the chance of re-infection through continued “F” and “E” protocols.

REFERENCES


RECOMMENDATIONS

1. Integrate all components of the SAFE strategy with a standardized protocol
   - Cohesive implementation of the SAFE strategy for a minimum of 5 years has shown promise in eliminating trachoma-induced blindness worldwide.
   - A continued effort to pursue concurrent implementation of all four components of the SAFE strategy can achieve the long-term goals of the WHO to eliminate trachoma blindness.
   - Implementation of the SAFE strategy in its entirety should be conducted with standardized protocols (i.e. clear definitions and benchmarks) of each of the components should be developed and used in each SAFE strategy program.

2. Provide robust and culturally sensitive education to improve “F” and “E”
   - A more robust educational component be implemented to educate the public about the disease and ways to prevent its spread.
   - This may be difficult due to the diversity of regions (e.g. clean water access) in which trachoma is endemic, but the value of improving prevention education would be worth the effort.

3. Address social determinants that increase the risk of contracting trachoma
   - Trachoma is most prevalent among impoverished and marginalized populations. This subset of individuals is also likely to be illiterate.
   - A lack of basic education impedes SAFE strategy implementation, particularly in implementing the “F” and “E” components.
   - In order to benefit from the goals of hygiene education, communities must instill their citizens with the skills to assimilate and integrate “F” and “E”.

4. Ramp up all four components of the SAFE strategy
   - The 2020 goal of elimination of trachoma-induced blindness cannot be achieved at the current levels of SAFE strategy implementation.
   - If this goal reached is there an enormous backlog of adults who will need surgery to cure their active trachoma damage.

Table 1. Literature review. References were further scrutinized for internal & external validity (i.e. study strengths, study weaknesses, statistical significance, findings).

Table 2. Literature review. References were further scrutinized for internal & external validity (i.e. study strengths, study weaknesses, statistical significance, findings).

Table 3. Literature review. References were further scrutinized for internal & external validity (i.e. study strengths, study weaknesses, statistical significance, findings).

Table 4. Literature review. References were further scrutinized for internal & external validity (i.e. study strengths, study weaknesses, statistical significance, findings).

Fig 1. Worldwide distribution of active trachoma. Trachoma is endemic in 51 countries and is often seen in situations of poverty or unfavorable living conditions. Figure adapted from the World Health Organization (WHO).

Fig 2. Infection by C. trachomatis causing active trachoma. Infection by C. trachomatis causing active trachoma. The infection is not localized to the conjunctiva of the upper eyelid, which eventually leads to the visible signs (trichiasis, ptosis, blepharitis). Periorbital pain of the cornea increases the individual’s susceptibility to secondary infections. Without preventive surgical treatment, trachoma-induced corneal irritation leads to irreversible blindness. Figure adapted from the Fred Hollows Foundation (hollows.org.au).

Fig 3. The four components of the SAFE strategy to eliminate blindness. Elimination of blindness is achieved when the prevalence of active trachoma infections at the district level falls below 5% among children aged one to nine years. Figure adapted from the International Trachoma Initiative (trachomainitiative.org).

Fig 4. Large-scale implementation of the SAFE strategy. Organisations such as the Queen Elizabeth Diamond Jubilee Trusts Trachoma Initiative have plans to implement large-scale SAFE strategy programs in several endemic countries beginning in 2015. Figure adapted from the International Trachoma Initiative (trachomainitiative.org).