

Trachoma in the Wilaya of Adrar in Mauritania

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Received: 23 Mar 2025; Accepted: 05 Apr 2025; Published: 16 Apr 2025

Citation: Souleimane Ahmed Deida, Mohamed Abdellahi Hamed Cheikh Ahmed, Abdellahi Minnih, et al. Trachoma in the Wilaya of Adrar in Mauritania. American J Pathol Res. 2025; 4(1): 1-5.

ABSTRACT

Introduction: Trachoma is a keratoconjunctivitis caused by a bacterium *chlamydia trachomatis* transmitted by dirty hands, soiled linen and flies. Trachoma is a real public health problem in developing countries including Mauritania and particularly in the Adrar regions.

Objective: To determine the prevalence of follicular trachoma and trachomatous trichiasis in the Adrar regions.

Materials and Methods: This is a retrospective longitudinal study aimed analytically over a period from 2004-2017 based on series of surveys conducted by NPCB and its partners (ITI, FB and LCI).

Results: Our study shows a follicular trachoma rate of 27.12% in 2004; 11.2% in 2007; 7.3% in 2011 and 2.99% in 2017, as well as a trachomatous trichiasis rate 2.2% in 2004; 1% in 2007; 0.48% in 2011 and 0.12% in 2017 this in the Adrar region. The therapeutic coverage rate averaged 85% in the various MDA campaigns.

Conclusion: Trachoma, which was a real public health problem in the Adrar regions in the early 2000s, has been significantly reduced, allowing the transition from the endemic state to the pre-certification phase that requires Epidemiological monitoring., but which decreased significantly thanks to the implementation of the SAFE strategy, especially the S and A main object of our study.

Keywords

Community eye health, Public health in Adrar, Sanitation and hygiene in Mauritania, Access to clean water, Preventable blindness.

Introduction

Trachoma, a social disease par excellence, is one of the most widespread and oldest ophthalmological conditions [1]. It is a keratoconjunctivitis caused by a *chlamydia trachomatis* bacterium which transmitted by dirty hands, soiled linen and flies. It mainly affects the poorest regions [2]. Trachoma remains the leading cause of preventable blindness worldwide, and affects the future of the child in terms of learning and socio-professional integration.

As a result of repeated infections, the scars formed, the eyelashes turn inward entropion / trichiasis.

The permanent friction of the eyelashes on the cornea causes the appearance of corneal opacities and permanent blindness. As a result, it represents a very heavy burden for society and regardless of the suffering of the patients affected by it. It creates a real public health problem and a major handicap [3]. Certain groups are known to be vulnerable, preschool children and women 15 years and older. Trachoma has gradually disappeared in industrialized countries with the improvement of socio-economic conditions and health habits. This preceded the availability of any antibiotic. However, it still persists in the form of residual foci in certain

countries of Central America, South America and particularly in Africa [4]. Faced with this situation, the WHO launched in 1996 the general objective of eliminating trachoma as a cause of avoidable blindness by 2020. A body to coordinate efforts aimed at achieving the objective has been created: The Alliance of the World Health Organization for the Elimination of Blind Trachoma by the year 2020 or GET2020. This Alliance has placed Mauritania among the countries where we should act as a priority.

A global strategy based on the evolution of trachomatous disease has been proposed: the "SAFE" strategy [5]. This strategy combines trichiasis (S) surgery; antibiotic treatment of active forms (A); cleaning children's faces (F) and finally changing the environment (E) to permanently eliminate blinding trachoma.

Today the number of people who should benefit from the A, F or E components of the SAFE strategy has decreased from 204 million in 2014 to 192 million in 2015. In 2016, 190.2 million people in total worldwide needed A, F or E interventions to eliminate trachoma. Of these people, 90.1% lived in the African region and 39% were residents of Ethiopia in 2016 [6]. This work aims to determine the prevalence of follicular trachoma (FT) in children 0-10 years and trachomatous trichiasis (TT) in women 15 years and older in the wilaya of Adrar and to assess certain risk factors linked to the use of latrines and the presence or absence of animals.

Materials and Methods

Nature of The Study

This is a longitudinal, retrospective, multicentric, descriptive study for analytical purposes based on the series of surveys carried out by the National Program for the Fight against Blindness (PNLC) targeting the wilaya of Adrar in order to determine the prevalence of trachoma in all its forms (in particular TF and TT) in order to be able to implement actions for eliminating blinding trachoma.

Study Setting

Originally, the surveys carried out by the PNLC focused on the rural and urban populations of the country's various wilayas. A baseline survey administered in 2000 which made it possible to establish a trachoma mapping at the national level, the PNLC worked out in collaboration with its partners (FB, ITI, LCI) an action plan aiming for the elimination of trachoma in 2020 horizon in accordance with the WHO Global Eliminate of Trachoma for year 2020 GET2020. Then, interventions in the field were carried out and evaluated by means of cascading impact surveys (2004-2007-2011-2017). These surveys have focused on vulnerable groups (children 0-10 years and women 15 years and older). The choice of Adrar wilaya is motivated by the availability and regularity of the data over the period, the high level of prevalence recorded and the existence of residual pockets requiring targeted mass treatment

Sampling

The surveys concerned the rural and urban populations of the Adrar wilaya. We calculated the sample size using each of the prevalences assumed by Wilaya from data from the 2000 Trachoma Prevalence and Severity Survey (EPGT2000). The sampling was based on

data from RGPH 2000 and RGPTS 2013. The homogeneity effects of the clusters were assumed to be constant and not to exceed 2. An accuracy of 95% was considered.

To determine the number of people to be investigated, the following formula was applied:

n: sample size for each Moughataa.

K: homogeneous effect of the clusters.

$$n = k \times t^2 \times \frac{p \times q}{d^2}$$

t: 1.96 for 95% accuracy.

p: prevalence of TF provided by RGPH 2000.

q: 1-p

d: deviation.

It is a two-stage random survey.

The first-degree units are the DR.

The drawing of the sample was carried out in two stages:

- The first-degree draw consists of drawing the DR
- Second degree drawing consists of randomly drawing households within each DR.

Inclusion and Exclusion Criteria

All subjects with trachoma or non, whom residents (six months or more) in the sample locality or neighborhood were included. trachoma cases were diagnosed and recorded using the simplified trachoma scoring offered by the WHO blindness prevention program. Any trachomatous subject or non-resident less than 6 months in the sample locality or neighborhood was excluded. Any uncertain case was also excluded as well as the refusal is excluded.

Examination Procedure

The examination was carried out using binocular magnifiers (X 2.5) and under adequate lighting, daylight or a torch. The examiner first looked for the presence of eyelashes deflected toward the globe (TT), then corneal opacity (CO), in which case an examination of visual acuity would be necessary. He then looked on the tarsal surface for signs of inflammation (TF and TI) and scarring (TS) each eye was examined separately; any sign should be clearly seen to be considered present. When in doubt, a sign was considered absent. The adult subjects were seated facing the examiner, who was seated himself. Children can stand in front of the examiner. As for infants and very young children, their heads are placed between the knees of the examiner, the face turned upwards, the child's body being firmly held on the knees of another adult seated opposite the examiner. As soon as he finished examining a subject, the examiner would wash his hands with an appropriate disinfectant and allow them to dry before examining the eyes of the next subject. He must also make sure that he has entered all the examination data on the register.

Examen Tools

They include:

- Torches

- Bin Binocular magnifiers allowing a magnification of 2.5
- Optotypes presented in the form of washable plastic boxes. The E is printed in two formats: 0.3 and 0.1
- A standard string 6 meters long, with a knot in its exact middle (3m) to ensure the reproducibility of the measurement of distances during successive examinations in different places
- 1% tetracycline ointment
- Disinfectant
- Soap
- Handkerchiefs

Collection of Data

- Data collection was carried out through two survey sheets: 5-3-1- Survey sheet on the prevalence and severity of trachoma.

It revolves around two essential headings, namely:

- Identification (moughataa, commune, locality, DR, health structure, number of children under 10 years examined)
- Census and diagnosis (Age, sex, household size, forms of trachoma, location OD OG).

Visual acuity measurement sheet for patients with TT and / or CO (Annex 5)

It contains the following elements:

- Identification of the person with TT and / or CO
- Questions relating to patients with Trichiasis
- Questions relating to patients with corneal opacity
- Measurement of visual acuity.

Data Analysis

The data collected were entered in Excel 2013 and then processed in IBM SPSS Statistics 20 for the part related to data crossing and the application of linear regression (trend), tests of Analysis of variance (ANOVA), Test Kruskal Wallis and Chi-square (a $P < 0.05$ was considered significant).

Results

We found that the highest prevalence of TF was in Ouadane Moughataa in 2004 (28.80%) followed by Chinguetti 28.30% in the same year and Chinguetti in 2007 14.80%. As well as the prevalence of TF was 2.99% in 2017 in the wilaya of Adrar (Table 1).

Table 1: Prevalences of TF at the level of the wilaya of Adrar 2004 to 2017.

Year	Atar	Chinguetti	Aoujeft	Ouadane	Adrar
2004	25%	28.30%	26.40%	28.80%	27.12%
2007	7.30%	14.80%	13.50%	8.90%	11.12%
2011	1.79%	11.90%	8.30%	-	7.33%
2017	2.99%	2.99%	2.99%	2.99%	2.99%

We found that the highest prevalence of TT was in Moughataa d'Aoujeft 2004 (3.30%) followed by Atar 1.10% in the same year

and Ouadane 2007 1.60%. As well as the prevalence of TT was 0.12% in 2017 in the wilaya of Adrar (Table 2).

Table 2: Prevalences of trachomatous trichiasis in the wilaya of the Adrar from 2004 to 2017.

Year	Atar	Chinguetti	Aoujeft	Ouadane	Adrar
2004	1.10%	0.00%	3.30%	0.00%	2.20%
2007	0.30%	0.60%	1.60%	1.60%	1.00%
2011	0.06%	0.80%	0.60%	-	0.48%
2017	0.12%	0.12%	0.12%	0.12%	0.12%

General Trend

Analysis of the trend in the prevalence of TF et TT shows a considerable regression of trachoma over time (Figures 1,2) (a strong and significant negative correlation, high coefficient of determination).

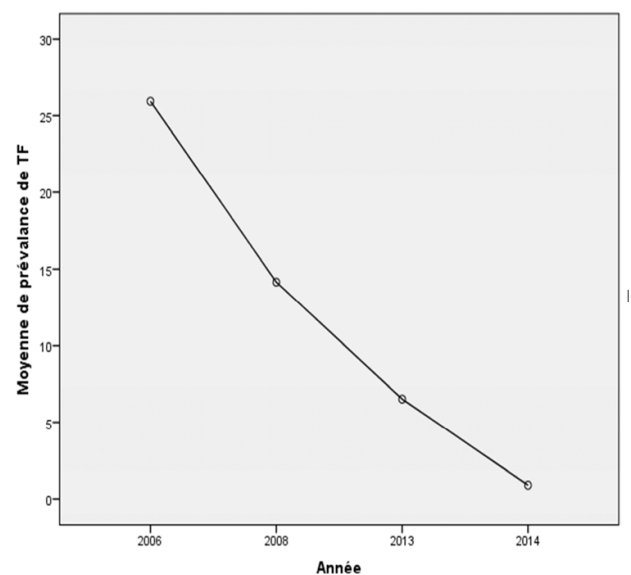


Figure 1: Evolution of follicular trachoma in the wilaya of the Adrar compared to the years of therapeutic intervention 2006 to 2014.

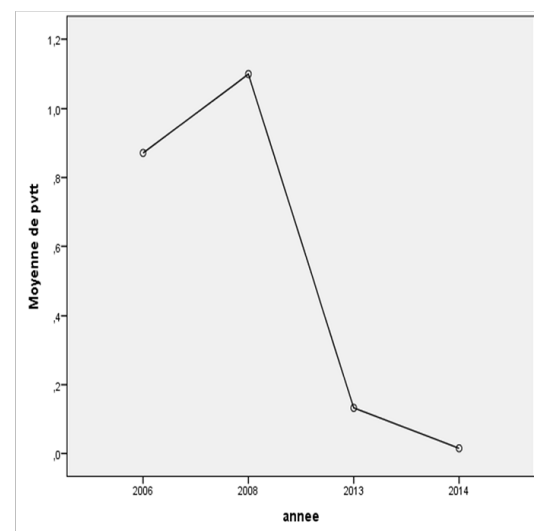


Figure 2: Evolution of trichiasis in the wilaya of the Adrar compared to

the years of therapeutic intervention 2006 to 2014.

Discussion

The objective of this study is to determine the prevalence of active trachoma and trichomatous trichiasis, in order to guide the interventions of the national program to control trachoma in the wilaya of Adrar. The choice of a longitudinal study allowed us to analyze all the series of surveys conducted by the PNLC and its partners (ITI, FB, LCI) from 2004 to 2017.

In this work we have used the simplified WHO classification to codify the different stages of trachoma. These surveys were followed by mass treatment with azithromycin and assessment of risk factors including the absence of latrines and the presence of animals in homes. The Ouadane Moughataa whose prevalence during the impact survey carried out in 2007 was less than 10% (lower than the WHO BIF). In this Moughataa, the absence of residual pockets explains the absence of targeted mass treatment unlike other Moughataas which had required targeted mass treatment because there are residual pockets of trachoma (Atar, Chinguetti et Aoujeft). In fact, according to the WHO, once a district reaches a prevalence <10%, it is necessary to stop distributing azithromycin and this district should be considered as temporarily cleared of trachoma. Reinforced hygiene promotion, in addition to the implementation of epidemiological surveillance measures, are therefore essential to be safe from a resurgence of the disease.

Currently the elimination of trachoma as a public health problem targets the following targets [6]:

- a prevalence of trichomatous trichiasis (TT) cases <0.2% in individuals ≥ 15 years of age (ie <1 case per 1000 in individuals of all ages);
- a prevalence of TF <5% in children from 1 to 9 years old, in each of the districts previously endemic;

In addition, there must be evidence that the health system continues to identify and manage incident cases. Furthermore, the national trachoma evaluation survey carried out in 2017 in which the evaluation unit corresponds to the wilaya, which explains the same adjusted prevalence found in all the Moughataas of the evaluation unit.

In our study, the prevalence of follicular trachoma (FT) in the Adrar wilaya in 2004 was 27.12%. These Prevalences are slightly lower than that of active trachoma found in a study carried out in Tanzania in 2004 by Evertjan Jansen et al., [7] which is 31%. They are however much higher than the prevalence found in Vietnam in the same study published in 2004 by Evertjan Jansen et al., [7] which is 14%.

In our work, the prevalence of trichomatous trichiasis (TT) is 2.2%. These rates of trichiasis are lower than that noted in 2004 by Evertjan Jansen et al., [7] which is 4%, they are also lower than the values found by studies published in 2001 and in 2004 respectively

by Abebe Bejiga et al [8] and Kefeyalew Regassa et al., [9] in Ethiopia who find a TT rate of 5.5% and 6.8%. The prevalence of trachoma is 11.12% for TF and 1% for TT. The rate of TF is comparable to the prevalence found in Vietnam in 2006 by Rajiv Khandekar et al., [10] which is 13.3%.

The prevalence of TF and TT found in Nigeria in 2008 by Nimzing F et al., [11] respectively of 24% for TF and 8% for TT are higher than those found in the wilaya of Adrar in 2007 which is 11, 12% for TF and 1% for TT. In 2011 we found a 7.33% prevalence of TF in the wilaya of Adrar. This rate is lower than the prevalence of TF found in Burundi in 2011 by Onésime Ndayishimiye et al., [12] which is 10%. Regarding the rate of TT in the wilaya of Adrar which is 0.48%. This rate is much lower than the prevalence of TT found by the study carried out in Guatemala in 2015 by Juan Carlos Silva et al., [13] which gives a rate of 3%. Regarding trichiasis in the wilaya of the Adrar, the 2017 survey found a rate of 0.12%. which is lower than that found in Malawi in 2016 by Khumbo Kalua et al., [14] which is 0.2% and that of the study carried out in 2016 in Ethiopia by Berhanu Bero et al., [15] which finds a rate 0.85% trichiasis. After each of these impact surveys (2004-2007-2011), mass treatment campaigns with azithromycin were carried out for three successive years, by the PNLC and its partners (ITI, FB, LCI). During these campaigns, the average therapeutic coverage rate in the wilaya was 85.4%. It is slightly lower than the value found for therapeutic coverage in Tanzania in the study published in 2018 by Alexander Jensen et al., [16] which is 95%. Regarding the F and E components of the SAFE strategy, in the fight against trachoma water plays a very important role by its accessibility, its quantity, its availability and especially its use. Regarding trachoma, children's hygiene is generally appreciated by the condition of their faces. Indeed, it has been shown that having a dirty face doubles the risk of being trichomatous [17], because facial dirt is often associated with pathological secretions from the eyes and nose. This dirt would attract fly vector of the disease, this observation is confirmed by several studies including the study of Paul M et al., in The Gambia [18]. These flies are also attracted by the presence of date palms which constitute the particularity of the wilaya of the Adrar object of our study. Facial cleansing appears to be a necessary, inexpensive hygiene practice for trachoma control. Hence the interest of awareness campaigns to get parents to ensure daily hygiene for their children. It should be noted that environmental hygiene is appreciated by the presence of latrines, their proper use, the presence of stables and waste management.

In fact, latrines make it possible to control pollution from feces and limit contamination from flies which are recognized as the main vectors in the chain of transmission of the disease [19]. Multiple studies have shown a decrease in prevalence when latrines existed in a concession. However, the presence of latrines and their use alone is not enough to reduce the density of flies. Indeed, they must meet certain criteria and be kept in a certain state of cleanliness so as not to become places of proliferation of flies [20].

In our study 85% of households own latrines in the Adrar

concession this is higher than the WHO BIF aiming to have more than 80% of households with latrines. If, the rarity of water explains, certainly the very high prevalence of trachoma in the early 2000s, in this wilaya, the proliferation of flies attracted by dates would constitute an additional risk factor for this disease.

Conclusion

Blinding trachoma, which is a public health problem in Mauritania, has decreased considerably thanks to the implementation of the SAFE strategy by the PNLC and its partners in accordance with the global initiative GET2020.

At the end of this study, it appears that the prevalence of TF at the start of the study was very high (27.12%). In 2017, this prevalence decreased to 2.99%.

It was noted that the prevalence of active trachoma experienced a clear, regular and constant decrease in all moughatas and throughout the duration of our study (four surveys). A rebound in the rate of trichiasis was noted in 2008. This notable improvement is due to the various interventions carried out by the PNLC and its partners.

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