

TRACHOMA IN PONDOK PESANTREN SALAFIYAH SYAFIYAH, SUKOREJO, SITUBONDO, EAST JAVA. A CASE STUDY

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ABSTRACT

The objective of this study was to examine the occurrence of trachoma in Pondok Pesantren Salafiyah Syafiyah, Sukorejo, Situbondo, East Java, including the prevalence of Trachoma, conditions that possibly played a role in the distribution of trachoma, and the factors involved in the distribution of the disease in Pondok Pesantren Salafiyah Syafiyah, Sukorejo, Situbondo. The study was undertaken in July, August, and September 2002 at Pondok Pesantren Salafiyah Syafiyah, Sukorejo, Situbondo. The population was the students (santri) of the pondok, which represented a type of close community. A number of 1642 samples were taken using multi stage systematic random sampling based on the level of education. Results obtained after observation and data analysis using multiple logistic regression were as follows: the prevalence of trachoma in Pondok Pesantren Salafiyah Syafiyah, Sukorejo, Situbondo was 16.3%; possible condition in trachoma distribution was the high density of inhabitant and the habit of not using running water during wudhu (ritual ablution before prayer). Factors involved in the distribution of trachoma in the pondok are sex and individual sanitation hygiene. We suggest further studies to investigate other factors implicated in the distribution of trachoma in Pondok Pesantren Salafiyah Syafiyah, Sukorejo, Situbondo. Actions to cut the distribution of the disease are also important, such as by improving the students attitude, knowledge and behavior on the health of their eyes, particularly in relation with the prevention of trachoma; to provide more clean water and installation of taps so that they can use running water for taking wudhu.

Keywords: trachoma, prevalence, dense inhabitants, wudhu, clean water, running water, pondok pesantren

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INTRODUCTION

At a glance, one may regard trachoma as an ordinary disease. In fact, this disease remains a part of medical as well as social problems. Trachoma is the cause of blindness in many developing countries. This disease disturbs daily activities of the patient, which may finally result in losing his/her job (Assad 1973; Foster 1990; Idajadi 1993). Whereas, the early finding of this disease will enable the disconnection of the chain of its distribution and its finding in early stage also allow the patient to be cured. Unfortunately, in practice trachoma remains a disease that is commonly found everywhere.

A study by Wisnujono Soewono at Dr Soetomo Hospital for 8 years from 1984 to 1991 to all trachoma patients admitted at the outpatient clinic revealed that 20.84% of the patients had visual acuity of less than 3/60 (Soewono 1993). Foster (1990) estimated that today there are 350 million persons who suffer from trachoma, and 80 millions of which are children (Foster 1990). The report of the survey on morbidity and blindness in 1982 shows that the blindness rate in Indonesia is 1.27%. This survey also found that the

distribution of trachoma without trichiasis 0.5 % and trachoma with trichiasis 0.26 % (Hamurwono 1990).

A study by Sjamsu Budiono at Dr. Soetomo Hospital, Surabaya, in 1980 demonstrated that the prevalence of blindness resulting from trachoma complication was 27.31% in right eye and 2.06% in left eye (Budiono 1980). A research by Gatut Suhendro and Isnania Koento in three villages in East Java in 1978 found that the percentage of trachoma distribution was 1.69% in mountainous area (Sonoageng village), 0.22% in plain area (Pohsarang village), and 9.59% in coastal area (Kranji village). It is apparent that trachoma is mainly found in coastal area (Suhendro 1978). Once again, it proves that trachoma remains a problem in Indonesia. Additionally, the ophthalmologist who was on duty in Situbondo also reported numerous cases of trachoma among the students of the pondok. Since trachoma can be prevented and treated, these facts leave an intriguing question whether it had correlation with environmental factors and poor sanitation hygiene. This study was undertaken to identify the prevalence rate of trachoma in Pondok Pesantren Salafiyah Syafiyah, Sukorejo, Situbondo, East Java; possible condition and factors that enable the distribution of the disease.

MATERIALS AND METHODS

This was an observational analytic study using cross-sectional design. The study was carried out to the students of Pondok Pesantren Salafiyah Syafiiyah, Sukorejo, Situbondo, East Java who met the inclusion criteria from July to September 2002. The population is the students of the pondok, comprising 8608 persons. Samples were 533 persons those who were selected to represent the population. The selection was done using multistage systematic random sampling based on the level of education.

The dependent variable was the prevalence of trachoma. Trachoma diagnosis was established based on clinical appearance, in which there were at least two of four clinical signs as follows: the presence of follicle in superior tarsal conjunctiva, limbal follicle, or its cicatrix (Herbert's Pits); the presence of keratitis mainly on upper one-third of the cornea, pannus in superior limbus, and typical conjunctival cicatrix. The independent variables were environment (yards, garbage disposal sites, fluid waste disposal), individual sanitation hygiene (the habit of bathing, face washing, hand washing, the use of towel, shirt, handkerchief, and eyeliner); public sanitation hygiene (the availability of clean water and *wudhu* facility, bedroom, prayer room and its facility, kitchen, toilet, and urinoir); age; sex; and education.

The following data were recorded in this study: name of the students, their age, education, the habit of bathing, face washing, hand washing, the use of towel, shirt, handkerchief, and eyeliner. Facilities observed were

clean water, facility and the students' way to conduct *wudhu*, condition of bedrooms, bathrooms, toilets, kitchen, garbage disposal sites and fluid waste disposal. Using flashlight and loupe, clinical observation was carried out to the students to examine natural vision and to observe anterior segments (superior/inferior palpebra, superior/inferior palpebral conjunctiva, bulbous conjunctiva, and cornea). The results were recorded in available forms.

RESULTS

Pondok Pesantren Salafiyah Syafiiyah Sukorejo is a traditional Pondok Pesantren located at the northern coast of Java. The students in this pondok come from various regions in Indonesia. The interest to study in this institution is increasing from year to year. This inevitably results in increased crowding of the pondok's inhabitants. This fact facilitates the distribution of certain infectious diseases, such as redness in eye and itch, even though in general the sanitation hygiene of the students can be regarded as sufficient.

The examination done to 1642 students revealed that 268 positively suffered from trachoma (the diagnosis was established based on field diagnosis from WHO Expert Committee on Trachoma). Therefore, the prevalence of trachoma in Pondok Pesantren Salafiyah Syafiiyah, Sukorejo, Situbondo, was 16.3%. The distribution is as follows: 241 (88.8%) had the glaucoma in both eyes and 27 (11.2%) only in one eye.

Table 1. Sex distribution of students with trachoma in Pondok Pesantren Salafiyah Syafiiyah, Sukorejo, Situbondo

Sex	Diagnosis		Total
	Trachoma (-)	Trachoma (+)	
Male	801 (91.3%)	184 (18.7%)	985 (60.0%)
	573 (58.3%)	84 (68.65%)	
Female	573 (87.2%)	84 (12.8%)	657 (40.0%)
	41.7%	31.34%	
Total	1374 (83.7%)	268 (16.3%)	1642 100.0%

From 985 male students examined, 184 (18.7%) were positive with trachoma and from 657 female students, 84 (12.8%) were found with trachoma. Thus, from 268 students with trachoma, 184 (68.65%) were male and 84 (31.34%) female.

Table 2. Age distribution of students with trachoma in Pondok Pesantren Salafiyah Syafiiyah, Sukorejo, Situbondo

Age	Diagnosis		Total
	Trachoma (-)	Trachoma (+)	
≤ 10 years	77 (92.8%) (5.6%)	6 (7.2%) (2.2%)	83 (5.1%)
11 – 15 years	733 (81.7%) (53.3%)	164 (18.3%) (61.2%)	897 (54.6%)
16 – 20 years	521 (85.4%) (37.9%)	89 (14.6%) (33.2%)	610 (37.1%)
21 – 25 years	36 (80.0%) (2.6%)	9 (20.0%) (3.4%)	45 (2.7%)
26 – 30 years	5 (100.0%) (0.1%)	-	5 (0.3%)
> 30 years	2 (100%) (0.1%)	-	2 (0.1%)
Total	1374 (83.7%)	268 (16.3%)	1642 (100.0%)

Table 3. Education distribution of students with trachoma in Pondok Pesantren Salafiyah Syafiiyah, Sukorejo, Situbondo

Education	Diagnosis		Total
	Trachoma (-)	Trachoma (+)	
Kindergarten	17 (100.0%) (1.2%)	-	83 (1.0%)
Elementary School	168 (87.5%) (12.2%)	24 (12.5%) (9.00%)	192 (11.7%)
Junior High School	717 (82.2%) (52.2%)	155 (17.8%) (57.8%)	372 (53.1%)
Senior High School	401 (83.2%) (29.2%)	81 (16.8%) (30.2%)	482 (29.4%)
Higher Education	71 (89.9%) (5.2%)	8 (10.1%) (3.0%)	79 (4.8%)
Jumlah	1374 (83.7%)	268 (16.3%)	1642 (100%)

From the students recruited as samples, the youngest was 5 years old and the oldest 31 years old. From 83 students aged 10 years or less, 6 (7.2%) was positive with trachoma. From 897 students aged 11 to 15 years, 164 (18.3%) was found with trachoma. From 610 students aged 16 to 20 years, 89 (14.6%) had trachoma. From 45 students aged 21 to 25 years, 9 (20.0%) also had trachoma. However, from 5 students aged between 26 and 30 years, and 2 students aged more than 30 years, none were found with trachoma. Taken together, from 268 students with trachoma, 6 (2.2%) students

aged 10 years or less, 164 (61.2%) aged from 11 to 15 years, 89 (33.2%) students aged 16 to 20 years and 9 (3.4%) students aged 21 to 25 years.

Various educational facilities similar to kindergarten, elementary school, junior and senior high school, as well as higher education, are available in this pondok pesantren. From 258 students with trachoma 24 (9.0%) students were educated at elementary level, 155 (57.8%) were educated similar to junior high school, 81 (30.2%) senior high school, and 8 (3%) higher education.

Table 4. Distribution of individual sanitation hygiene among students with trachoma in Pondok Pesantren Salafiyah Syafiiyah, Sukorejo, Situbondo

Individual Sanitation Hygiene Values	Number of students
14	601 (36.6%)
15	543 (33.1%)
16	344 (21.0%)
17	71 (4.3%)
18	83 (5.1%)

Individual sanitation hygiene observed in this study consisted of the habit of bathing, face washing, hand washing, and the habit of using or borrowing towel, shirt, handkerchief, and eyeliner. It was found that the total scores of individual sanitation hygiene varied between 14 and 18 (the range of the total score was 8 - 20). From 1642 students examined, 601 (36.6%) had the

score of 14, 543 (33.1%) had the score 15, 344 (21.0%) had the score of 16, 71 (4.3%) of the students had the score 17, and 83 (5.1%) had the score of 18. The average value of individual sanitation hygiene among students of Pondok Pesantren Salafiyah Syafiiyah was 14.17 with the standard of 0.37 (the range of the total score of individual hygiene sanitation was 8 - 20).

Table 5. Total average score of environment and sanitation hygiene of the students of Pondok Pesantren Salafiyah Syafiiyah Sukorejo Situbondo.

No.	Condition	Average total score	Standard Deviation	Note
1.	Pondok's environment	10	0	Moderate
2.	General Sanitation Hygiene	16	0	Inadequate
3.	Individual Sanitation Hygiene	14.17	0.39	Moderate

In general, the Pondok Pesantren Salafiyah Syafiiyah Sukorejo Situbondo has environmental condition with moderate value. The condition of sanitation hygiene in general was less adequate, while the individual sanitation hygiene of the students was moderate.

Trachoma is a chronic transmittable disease. Its distribution occurs either through direct or indirect

contact with the patient's secreta. In a condition where the presence of pathogenic agent is increasing and host's immunity is decreasing, and worsened with poor sanitation hygiene, the exposure of the disease is enhanced, so that the individual will be contacted with trachoma. It is obvious that sanitation hygiene, either general or individual, as well as environmental condition, have an important role in the distribution of

trachoma. This study had obtained the score distribution of individual sanitation hygiene among patients with

trachoma in Pondok Pesantren Salafiyah Syafiiyah. Sukorejo, Situbondo. The distribution is as follows:

Table 6. The score distribution of individual sanitation hygiene among students with trachoma in Pondok Pesantren Salafiyah Syafiiyah Sukorejo Situbondo

Individual SH value	Diagnosis		
	Trachoma (-)	Trachoma (+)	Total
14	380 (63.2%) (27.7%)	221 (36.8%) (82.5%)	601 (36.6%)
15	497 (91.5%) (36.2%)	46 (8.5%) (17.2%)	543 (33.1%)
16	343 (99.7%) (25.0%)	1 (0.3%) (0.4%)	344 (21.0%)
17	71 (100.0%) (5.2%)	-	71 (4.3%)
18	83 (100.0%) (6.0%)	-	83 (5.1%)
Total	1374 (83.7%)	268 (16.3%)	1642 (100.0%)

From all students examined, the minimum total score of individual sanitation hygiene was 14 and the maximum was 18. From 601 students with the minimum value of 14, 221 (36.8%) had Trachoma. From 6543 students with the value of 15, 56 (8.5%) were found with trachoma. From 344 students with the individual score

of 16, only 1 (0.3%) had trachoma, while 71 students with individual score 17 and 83 students with score 18 all had no trachoma. Thus, from 268 students with Trachoma, 221 (82.5%) were students with individual sanitation hygiene score of 14, 46 (17.2%) with score 15, and 1 (0.4%) with score 16.

Table 7. Multivariable analysis (multiple logistic regression) towards the risk factor of Trachoma in Pondok Pesantren Salafiyah Syafiiyah Sukorejo Situbondo

No	Variables	p	Notes
1	Sex (female)	0.0003	Significant
2	Individual SH	0.0000	Significant
3	Age	0.13256	Not significant
4	Education	0.5443	Not significant

To find correlation between the occurrence Trachoma and environment in Pondok Pesantren Salafiyah Syafiiyah Sukorejo, we had to analyze several risk factors of Trachoma in the Pondok. In above table, it can be seen that the variables of sex and individual sanitation hygiene had significant correlation with the occurrence of Trachoma in Pondok Pesantren Salafiyah Syafiiyah Sukorejo, while the variables of age and education had no significant correlation.

In addition to above data, there were other facilities that might also play a role in the distribution of Trachoma in the Pondok. Those factors are, for example, the density and the habit in taking *wudhu*. The density in the Pondok was very high, as could be seen from the ratio between students and available bedrooms. There were 231 bedrooms for 8606 students. The size of the bedroom was ca. 5 x 7 m, and each was inhabited by ca. 30 students. Regarding the habit in *wudhu*, as there was a shortage in the provision of flowing water, the students could not conducting *wudhu* using flowing water. Instead, they used water pooled in a large water basin by bending their body over the water basin.

DISCUSSION

In this study, where the diagnosis of trachoma was established based on the criteria of field diagnosis from "WHO Expert Committee on Trachoma", it was found that the prevalence of trachoma in Pondok Pesantren Salafiyah Syafiiyah Sukorejo Situbondo was 16.3%. The result was higher than the prevalence found in the study by Suhendro and Koento (1978) who found the prevalence in East Java's coastal area of 9.59%. The difference could result from the difference in sample size, disease distribution, and the condition of areas used for study, and sample collecting method. In addition, the community in Pondok Pesantren Salafiyah Syafiiyah Sukorejo Situbondo is a close community, in which in the daily life there is a close relation between one student and the others. If we meet the diagnosis criteria of MacCallan (as an illustration), the prevalence of trachoma would be higher, 48.2%. However, it is not appropriate to say that trachoma identification method from MacCallan is more sensitive from that of WHO, since WHO method is used for field survey where the availability of facilities is very limited (Field Diagnosis Criteria) (Assad 1973; Darougar 1975; Dawson 1981; Schwab 1996).

In this study, the distribution of trachoma infected eyes was as follows: from 268 students with trachoma, 241 (88.8%) were affected in both eyes and 27 (11.2%) in only one eye. Sugiarto (1993) in his study on elementary school children in Kabupaten Sidoarjo found

that 98.74% of trachoma affected both eyes, while only 1.26% affected one eye. This result confirmed our findings. In several literatures, it is stated that trachoma generally affects both eyes (bilateral), confirming the finding of this study (Bayley 1994; Budiono 1980; Sugiyanto 1993; Vaughn 1992; Soewono 1993).

The distribution of trachoma in Pondok Pesantren Salafiyah Syafiiyah Sukorejo Situbondo was 68.65% in male students, and 31.34% in female students. It is apparent that the percentage in male students is higher than that in female students. This also confirmed the findings of Moegiono and Soewono (Moegiono 1990) who in their study at ophthalmology outpatient clinic in Dr Soetomo Hospital, Surabaya, in 1990 found that trachoma distribution in male was 53.45% and that in female was 44.55%. The higher percentage in male could also result from biological factor. Biologically, male is more vulnerable than female. In poor hygiene condition, male become more sensitive than female, so that many of them are affected with trachoma (Pariani 1997).

Foster (1990) estimated that today there are 350 million trachoma patients worldwide, and 80 million of which are children. In this study, we found that the highest percentage was found in children of 11 to 15 years old, i.e., 61.2%. Several literatures mention that trachoma mainly affects children, although it may also be found in all ages. The difference of the result could be due either to different community chosen to be involved in this study or to the difference in sample size and to close correlation with local sanitation hygiene (Cougdon 1993; Vaughn 1992).

This study also revealed the difference of individual sanitation hygiene between male and female students. However, after being estimated, the difference was not significant. The disease was mild. The difference of community involved, sample size, and sampling method were the factors that likely resulted in the different results in this study. Additionally, the individual sanitation hygiene should also be considered as the cause of the difference.

In Table 3, it can be seen that the highest percentage are among the students with junior high school level of education (57.8%). This was closely related to environmental factor, density, and individual sanitation. In addition, it was also possible that the samples available were mostly students who were being educated at junior high school (Cullorn 1994; Schwab 1995).

Environmental condition is regarded as adequate if the number of score is 12, moderate if the score is < 12 - 9, and not adequate if the score is < 9. Thus, the score of

environmental condition in the Pondok belonged to moderate category. The less qualified environmental condition might also support the higher prevalence of trachoma in the Pondok. In this study, environmental condition could not be analyzed as a variable, since it needed comparison. This fact is, whatsoever, the shortcoming of this study, since in some literatures it is mentioned that the distribution of trachoma is remarkably influenced with environmental condition dan sanitation hygiene, either individual or general.

The total score of general sanitation hygiene in this Pondok was 16 with standard deviation 0. The range of score for general sanitation hygiene was 12 to 30, in which the sanitation is regarded as adequate if the total score is 24, moderate if $< 24 - 18$, and not adequate if the score is less than 18. In this study, we found that the score was 16, so that the general sanitation hygiene was not adequate. The inadequate condition of general sanitation hygiene must also have influence on the high prevalence (distribution) of trachoma in Pondok Pesantren Salafiyah Syafiiyah Sukorejo Situbondo. However, we were unable to analyze this condition with statistical test since such analysis required a comparison, so that further studies are needed to evaluate the general sanitation hygiene in the Pondok.

Individual sanitation hygiene is regarded as adequate if the total score is 16, moderate if the score is $< 16 - 12$, and inadequate if the score is < 12 . The average score of student's sanitation hygiene in the Pondok was 14.17 with standard deviation of 0.39, showing that the individual sanitation hygiene was moderate. This condition facilitated the distribution of trachoma in the Pondok. Previous studies showed that the distribution of trachoma is closely related with sanitation hygiene, density, the availability of clean water facility, as well as environmental factors. In this study, the highest percentage of trachoma distribution was among the students with total score of 14 (82.5%), where this score is the minimum total score for sanitation hygiene found in this study. It was apparent that along with the increasing score number of individual sanitation hygiene, the percentage of trachoma patients was decreasing. This condition must have related closely with daily activities of the students, such as the habit of exchanging towel, shirt, handkerchief, and eyeliner, which endorsed the distribution of trachoma (Allansmith 1982; Sun 1992; Chandler 1994; Cullorn 1994; Walingan 1995; Wybart 1984).

In Table 7, the primary result of multivariable analysis on the risk factor of trachoma occurrence in the Pondok reveals that the variables of hygiene, sex, and individual sanitation hygiene have significant correlation with trachoma, while age and education have no direct

correlation with trachoma occurrence in the Pondok. There were several conditions that also played a role in the distribution of trachoma. Those conditions were the high density of inhabitants and habit in taking *wudhu*. Since trachoma is a chronic transmittable disease, high density is a suitable media for distribution. Similarly, the habit of taking *wudhu* not from flowing water, but from pooled water to which the used water fall back, was also potential for trachoma distribution. We had not been able to evaluate both conditions, in addition to environmental condition and general sanitation hygiene, as those variables needed comparison. This inability was the shortcoming of this study.

CONCLUSIONS

1. The prevalence of trachoma in Pondok Pesantren Salafiyah Syafiiyah Sukorejo is 16.3%.
2. Conditions that likely play a role in trachoma distribution in Pondok Pesantren Salafiyah Syafiiyah Sukorejo are the high density of inhabitants and the habit of taking *wudhu* by not using flowing water.
3. Factors that play a role in trachoma distribution in Pondok Pesantren Salafiyah Syafiiyah Sukorejo Situbondo are sex and individual sanitation hygiene.

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