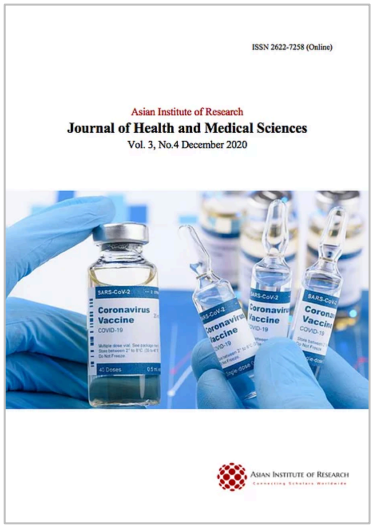

Journal of Health and Medical Sciences

Elamin, Mohamed Osman, Rahmtullah, Hatim, Khalid, Tahwid, Alngoomi, Abrar, Hamza, Khider Elisa, and Khalid, Sufian. (2020), The Determinants of Developing Tuberculosis at Specialized Hospital. In: *Journal of Health and Medical Sciences*, Vol.3, No.4, 429-436.

ISSN 2622-7258

DOI: 10.31014/aior.1994.03.04.137

The online version of this article can be found at:
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The Asian Institute of Research
Journal of Health and Medical Sciences
Vol.3, No.4, 2020: 429-436
ISSN 2622-7258

DOI: 10.31014/aior.1994.03.04.137

The Determinants of Developing Tuberculosis at Specialized Hospital

Mohamed Osman Elamin[1], Hatim Rahmtullah[2], Tahwid Khalid[3], Abrar Alngoomi[4], Khider Elisa Hamza[5], Sufian Khalid[6]

[1] Faculty of Public Health, Umm-Al-Qura University, KSA
[2,3,4,5] University of Bahri, Sudan
[6] Nile Valley University, Sudan

Abstract
Introduction: Tuberculosis (TB) infection is caused by Mycobacterium sp which can spread through the lymph nodes and bloodstream to all parts of the body. Objective: To identify the determinants of the developing TB at Khartoum locality in Al-shaab hospital. Methodology: A cases control study included 50 cases with diagnosis TB and 50 non TB controls from Al-shaab hospital in Sudan, cluster random sample technique used, designed questionnaire used to collect information, BMI was calculated. Results: The study showed that 72% from the positive participants were male found significant relationship between gender and TB infection (p value 0.004), 52% of them were between 30-40 years, significant relation found between the TB infection and age (p value 0.001), 60% lived inside of Khartoum, 70 % from the participant drink alcohol and smokers, with strong relationship (p value 0.000). Conclusion: The knowledge and raising awareness about factors that lead to infection, and improving socio-economic status can reduce the incidence of TB in the community, availability of direct observed therapy services can help.

Keywords: Tuberculosis, Determinant factors, Case Control Study, Al Shaab Hospital

Introduction

Tuberculosis (TB) infection is caused by a bacterium that, Mycobacterium sp can spread through the lymph nodes and bloodstream to all parts of the body. The germ is transmitted through the air is infectious disease. Tuberculosis is an infectious bacterial disease caused by bacillus tuberculosis and lead to damage to the lung tissue or other body organs (WHO, 2006). The disease was discovered on March 24, 1882 by German scientist Robert Koch. It was in ancient times called the deadly disease. The researchers found the discovery of appropriate treatment for these bacteria from antibiotics 40 years ago after caused the death of millions of people (Crofter et al., 1995). The most at risk to the disease are children and AIDS patients due to weakened immune systems. The WHO expect that during the next twenty years from the beginning of this century the number of tuberculosis (TB) patient will be billion people, or about one-sixth of the world's population now (WHO,1993). Tuberculosis is one of the most prevalent disease in the of Sudan, Although WHO, the Sudanese and health authorities are observing standard

ways of providing free treatment, but the problem still exists. Pulmonary tuberculosis or (TB) is a contagious bacterial infection caused by Mycobacterium tuberculosis. The lungs are primarily involved, but the infection can spread to other organs. Pulmonary tuberculosis can developed after inhaling droplets sprayed into the air from a cough or sneeze by someone infection by, Mycobacterium tuberculosis. The disease is characterized by the development of granular tumors in the infected tissues. One third of the world's population 2220 million people is estimated to be infected with Mycobacterium tuberculosis .However, the incidence of infection is not the same for males and females, estimated to be infected with the Mycobacterium tuberculosis (Dwainet .al.,1998).

Tuberculosis is a health problem among the Sudanese population. This was confirmed by surveys carried out by WHO in 1963. Changes in life style of Sudanese people, due to gross economical transformation, inflation, affliction towards nutritional habits, and traditional mining are factors that may enhance tuberculosis spread (Bayoumi,1979).T uberculosis is a classic example of disease that disproportionately affect the under privileged and witch,because of the social and economical burden, it imposes on individual, make access to cure a distant dream for a large majority(WHO,2012).

1.2 Problems statement

There are currently 16 million of people living with TB in the world each year, 2 million of them died, including of poor and developing country, this health indicators cannot be overlooked or dropped from our calculation because we are not immunized against the disease so as not to be quorum one person can affect 10-15 people per ear, in view of his statistic TB has caused the death of 200million people since 1882 until today, TB infection at least 1 person every 10 seconds TB infection count for 1% of the world population annually, TB still killed between 2-3 million people per year, which exceeds the total number of victims, AIDS, malaria, and disease of hot areas combined, it is expected that 30 million of people will die in the next decade. (Robert et al., 2003).

1.3 Justification

Global situation and trends: in 2015, there were an estimated 10, 4million new (incident) TB cases worldwide, of which 5, 9 million (56%) were among men, 3, 5 million (34%) among women and 1,0 million (10%) among children. people living with HIV accounted for 1,2 million (11%) of all new TB cases. There were an estimated 480 000 new cases of multidrug-resistant TB (MDR-TB) and an additional 100 000 people with rifampici – resistant TB (RR-TB) who were also newly eligible for MDR-TB treatment. There were an estimated 1,4 million TB death, and an additional 0,4 million deaths resulting from TB disease among people living with HIV. Although the number of TB deaths fell by 22% between 2000 and 2015, TB remained one of the top 10 causes of death worldwide in 2015.

1.3 OBJECTIVES

1.3.1 General objective:

To identify the determinants' of the developing TB at Khartoum locality in al-shaab hospital

1.3.2 Specific objective:

1. To determine the gender and age group of the disease
2. To identify which types of tuberculosis more spread among the patients
3. To identify the determinants factor that lead to tuberculosis (socio demographic factor, behavioral, nutritional).

Methodology

2.1 study design:

This study was descriptive analytical study by using case control approach to assess the determinants of developing tuberculosis among the patients in al-shaab hospital at Khartoum locality, April 2017.

2.2 Study area:

Al- Shaab hospital is located in the heart of Khartoum. It was founded in 1959 and was opened on November 17 of the sam year by Ibrahim aboud as an alternative to alnahrhospital, calledathwart hospital for thoracic diseases. Then the section of general surgery, heart, brain and neurology were opened. of which the total area of the hospital is 2500square meters. The public network is a groundwater well and distinguished by a hospital medical department under supervision of the general medical director in the department of operations. Nursing, medical engineering, statistic, diagnostic laboratories. The accidents and department of the physiotherapy and the department of health the administrative section under the supervision of the secretary general contains the administrative observer, workers, general system, al public relation, accounts, engineeringworshop, preparation of students, cleanliness and personnel affairs. DrMohieddinmahdi first director of the hospital, Suleiman Abu saleh the first director of the school of nursing people the first nursing in Sudan, celebrities died of tuberculosis Tijani Yusuf basher.

2.3 Study population:

There were two populations in this Studywhich includes; cases population and controls population. Cases population were participants affected by the diseases (Tuberculosis inpatients), and control population were participant free from tuberculosis (Tuberculosis outpatients)attending the Tuberculosis clinic in al-shaab hospital, Khartoum locality, 2017

2.4 Sampling techniques:

The sampling techniques in this study were total coverage patients attending TB unite in al-shaab hospital at Khartoum, 2017
n=N/1+N (e) 2
n= sample size
N=number of all participation
e = precision level =0.05
1= constant

2.5 study sample size:

The sample size obtained was (100) patients (inpatients and out patients), male were 57 while female 43patients attending the Tuberculosis unite in al-shaab hospital at Khartoum locality, April 2017

2.6 Data collection techniques:

Primary data (record inalshaab hospital). Secondary data was collected by using questionnaire which included information about socio-demographic, socio economic and environmental factors and statistical information

2.7 Data analysis:

The collected data from study units has been entered into the Statistical package of social science 20(SPSS version 20).

2.8 Ethical consideration:

The study was ethically approved by Faculty of Public and Environmental Health and al-shaab hospital Administration as well as all patients included in the study were agreed to respond after being informed about the purpose of study and the reasons behind sampling.

Results

Table (1) The distribution of participants according to the gender, in al Shaab hospital, Khartoum, April 2017, n =100

Gender	TB DISEASE				p value
	CASES		CONTROL		
	n	%	n	%	
Male	36	72.0	21	42.0	0.004
Female	14	28.0	29	58.0	
Total	50	100.0	50	100.0	

Table (1) shown that the majority cases group in this study was male (72%) of cases, and (42%) in control group, and female was(28%) in cases group and (58%) in control group, there is significant different between cases and control groups (p value 0.004). Tuberculosis associated with gender in this study.

Table (2) distribution of participants according to the Age groups in al Saab hospital, Khartoum locality, April 2017, n =100

Age	TB DISEASE				P value
	CASES		CONTROL		
	N	%	N	%	
10-20 years	6	12.0	7	14.0	0.001
20-30 years	8	16.0	26	52.0	
30-40 years	26	52.0	15	30.0	
More than 40	10	20.0	2	4.0	
Total	50	100	50	100	

Table (2) describe that majority of cases were 30-40 years, (52%) and the majority in control group was 20-30 (52%), chi square test shown the significant relation between the ages and disease, there was significant different between cases and control (p value 0.001)

Table (3) the distribution of level of education among the participants, in al-shaab hospital, Khartoum locality, April 2017, n=100

Level of education	TB DISEASE				P value
	CASES		CONTROL		
	N	%	N	%	
Uneducated	4	8.0	2	4.0	.010
Primary	6	12.0	1	2.0	
Secondary	5	30.0	10	20.0	
University	25	50.0	35	70.0	
Postgraduate	0	0.0	2	4.0	
Total	50	100	50	100	

Table (3) explain the majority of level of education in cases group was university (50%), and the majority in control was (70%) also university. There was different between cases and control groups (p value 0.10)

Table (4) the distribution of drinking alcohol or smoking among the participants, in al- shaab hospital, Khartoum locality, April 2017, n=100

Drunk alcohol or smoking	CASES		CONTROL		P value
	N	%	N	%	
Yes	35	70.0	8	16.0	.000
No	15	30.0	42	84.0	
Total	50	100	50	100	

Table (4) show that majority of cases group drink alcohol or smoke (70%)while who didn't drink (30%), and in control group the majority don't drink alcohol or smoking (84%) while who drink or smoke (16%), chi square is strong relationship (p value 0.000)

Table (5) the distribution of if the participants suffer from any other viral disease, al-shaab hospital, Khartoum locality, April 2017, n=100

Suffer from other viral disease	TB DISEASE				P value
	CASES		CONTROL		
	n	%	N	%	
Yes	39	78.0	0	0.0	.000
No	11	22.0	50	100.0	
Total	50	100	50	100	

Table (5) shown the majority of TB patient have other viral disease (78%) in cases group and (22%) there haven't while in control group all of them they haven't viral disease (100), chi square is strong relationship (p value 0.000)

Table (6) the distribution of if anyone from the participants families also has TB, Al-Shabab, hospital, Khartoum locality, April 2017,n=100

Family history TB disease	TB DISEASE				P value
	CASES		CONTROL		
	N	%	N	%	
Yes	28	56.0	6	12.0	.000
No	22	44.0	44	88.0	
Total	50	100	50	100	

Table (6) show that the majority of TB patient in cases group their family also suffered from the TB (56%) while who no one in their family suffered from TB(44%), and in control group the majority their family haven't TB (88%) and who their family was have (12%), chi square there is strong relationship (p value 0.000)

Table (7) the distribution of the type of TB among participants, al-shaab hospital Khartoum locality, April 2017, n=100

Type of TB	TB DISEASE				P value
	CASES		CONTROL		
	n	%	n	%	
Pulmonary	47	94.0	34	68.0	.006
Extra pulmonary	3	6.0	16	32.0	
Total	50	100	50	100	

Table(7) shown that the majority type of TB among the patient in cases group was pulmonary (94%) and extra pulmonary (6%), while in control group the pulmonary is (68%) and extra pulmonary (32%), chi square there is significant different between cases and control groups (p value .006)

Table (8) the distribution of the TB treatment among participants, Al-shaab hospital, Khartoum locality, April 2017, n=100

Type of treatment	TB DISEASE				P value
	CASES		CONTROL		
	N	%	N	%	
Al-aizoniazid	14	28.0	12	24.0	0.004
Reframing	33	66.0	24	48.0	
Al-aithanbotol	3	6.0	14	28.0	
Total	50	100	50	100	

Table (8) shown that the majority treatment the TB patient received is reframing (66%) in cases group, while in control group also the majority treatment is reframing (48%), chi square there is significant different between cases and control groups (p value 0.004)

Table (9) the distribution if the participants commit the treatment describe by the doctors Al-shaab hospital, Khartoum locality, April 2017,n=100

Commit the treatment describe by the doctor?	TB DISEASE				P value
	CASES		CONTROL		
	N	%	n	%	
yes	43	86.0	47.0	94.0	.009
No	7	14.0	3.0	6.0	
total	50	100	50	100	

Table (10) explain the majority TB patient in cases group was commit by the treatment describe by the doctors (86%) while (14%) don't commit by treatment describe by the doctor, in control group the majority commit by doctors treatment (94%) and (6%) don't commit, chi square there is significant different between cases and control groups (p value 0.009).

Table (10) the distribution if the participants who don't commit by the doctor's treatment ,that cause their health deteriorate , Al- shaab hospital, Khartoum, April 2017 ,n=100

If your answer is no, causehealth deteriorate?	TB DISEASE				P value
	CASES		CONTROL		
	N	%	N	%	
Yes	7	100.0	3	100.0	.000
Total	50	100	50	100	

Table (11) describe the majority of TB patient in cases group don't commit by doctor's treatment their health deteriorate (100%), and in control group also (100%), there is strong relationship between cases and control groups (p value 0.000)

Discussion

The study aimed to identify the determinants and risk factors of developing tuberculosis among the target groups to identify the age group, gender and other factors that facilitate tuberculosis spread.

The study revealed the majority (72.0%) of cases subjects is male and the female is 28% that mean the male is more exposure to infection by TB disease. there was association between the gender and the disease TB. There

was association between the gender and infection of TB. Previous study shown that the male is more affected by TB than female. the study agree with (park, 2015) which clarified that prevalence is higher among males.

The study revealed 52%of TB patient ages between {30-40 year}, 20% more than 40 year, and then 16% their age {20-30 year}, and the last age group {10-20year} is 12%, the finding indicate that the age {30-40year} is more exposure to TB infection than other age groups.

There was association between the age and infection of TB, .previous study showed that the age group (30-40 years) is more affected by TB than other groups.

The study revealed that 70%of TB patient drink alcohol or smoke and 30% of them don't drink alcohol or smoke, the finding indicate that drinking alcohol or smoking lead to exposure of TB.

There was association between the gender and infection of TB. Previous studies showed that the percipients who drink alcohol or smoke is more affected by TB than other people. The study agrees with (WHO, 2015), the possible biological mechanisms for the association between tobacco smoke and TB are that tobacco smoke results in; - impaired clearance of mucosal secretions in the trachea bronchial tree. This allows the M TB to reach the alveoli. - impaired functioning of the pulmonary alveolar macrophages, resulting in lower levels of cytokines being secreted. - Decreased intracellular tumor necrosis factor-α production leading to impaired intracellular killing MTB.

The study revealed 78%of TB patient have other viral disease indicating that other viral disease may accompany TB. There was association between the people suffer from viral disease and infection of TB.

The study revealed that 56%of TB patient found someone in their family also have TB and 44% of them haven't TB in their family, the finding indicate that the TB is easy to transmitted between the family members, There was association between the family history and infection of TB, Previous study showed that the persons with family history(heredity) is more affected by TB than others. study disagree with (Mhfnd, 2008) concluded that Tuberculosis is not a heredity disease however; twin studies indicate that inherited susceptibility is an important risk factor.

The study revealed 94% of TB patient the TB type they have is pulmonary and 6% have extra pulmonary, the finding indicate that the more type of TB spread is pulmonary.

Previous studies showed that the pulmonary is more effective than other types of TB, study agree (Hussein et al, 2003) which concluded that this type is the most frequent common type that affects the lung and leads to interweave damages.

The study revealed 82% of TB patient doesn't receive the BCG vaccine There was association between receiving the BCG vaccine and infection of TB,. Previous study showed that who didn't receive the BCG vaccine earlier is the more affected by TB than others, study agreed with Grigg et.al. 1958.

Conclusion

- The study concluded that the majority of TB patients are male 72%.
- The result show that 52% from TB patients ranging in the age group from (30-40year).
- 94% from the TB patients have pulmonary tuberculosis.
- 67% of TB patients have HIV.
- The majority of TB patients (82%) don't receive the BCG vaccine earlier.
- 28% from TB patient's loss their appetite and weigh less aloes 28% have cough more than three weeks.
- The majority of TB patients drink alcohol and smoke, 66% of patients have recently contact with other have tuberculosis.

Recommendations:

According to the above results here are recommendations:

- Minimize alcohol consumption in the country by legislations and awareness raising on the serious health risks associated with it.
- TB patients to be quarantined to stop transmission from patients to well people.
- Health authorities should ensure that all children had been vaccinated against Tuberculosis.
- Awareness raising campaigns among community on TB.
- Encourage patients for direct observed therapy.
- More researches are requested on TB determinants and risk factors.

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