

**STUDY OF INCIDENCE RATE AND MORE AT HIGH RISK GROUPS FOR
PULMONARY TUBERCULOSIS DISEASE IN WAD MADANI & AL MANAGIL
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ABSTRACT

This descriptive study was conducted in Gezira State – Wad Madani & Al Managil Hospitals – Gezira State- Sudan- from 2016 to 2018. With an aim to study the epidemiological factors of new positive cases among TB patients in Wad Madani and ELmanagil centers in Gezira State. The sample size was Total coverage of all new positive smear TB patients transferred to Wad madani and Elmanagil centers in Gezira state. About 221 samples. The data were collected by using the following methods, observation (check list) while managing to patients, structure questionnaire which distributed for each patient infected with tuberculosis disease for the first time, The data were analyzed manually using master sheets, and using statistical package for social science (SPSS), and data were depicted in tables and figures. The study indicated that the incidence rate in Wad Madani center about (22 cases per 100.000 population). While the incidence rate in Al managil center estimate (11 cases per 100.000 population), 60.1% of the patients know about infectious TB disease. The study indicated that (69%) of the patients were male, while female were (31%). Young people are the most affected by TB disease about (61%) of total patients, (30.3%) of the patients use of stimulants and (69.7%) didn't use, The important recommendations in this study is that Improvement of work environment for T.B centers in Gezira state by maintenance of clinics and laboratories, training of staffs. Raising of health education in community for contributing to detect and treatment cases of T.B disease.

KEYWORDS: Epidemiological, Factors, New positive, Tuberculosis, Centers.**1. INTRODUCTION**

Tuberculosis (TB), one of the most widespread infectious diseases, is the leading cause of death due to a single infectious agent among adults in the world.^[1]

The words “tuberculosis (TB)” and “M. tuberculosis,” the bacterium that causes TB, are used in different ways.^[2] The first known case of recorded pulmonary TB occurred between 668-626 BC. This record was found in the library of King Assurbanipal of Assyria the following is an extract: “The patient coughs frequently, his sputum is thick and sometimes contains blood. His breathing is like a flute. His skin is cold, but his feet are hot. He sweats greatly and his heart is much disturbed. When the disease is extremely grave, he suffers from diarrhea.^[3] It is estimated that between the years 2000 and 2010, eight to nine million new cases emerged each year. Approximately 1.5 million people die from the disease each year. In adults, tuberculosis is the second leading cause of the death due to infectious disease (after AIDS), with 95% of death occurring in low-income countries. Tuberculosis is a major problem of children in poor

countries where it kill over 100,000 children each year.^[4] Tuberculosis is caused due to slow dividing bacteria. As a result, it takes the infection several months to years to develop active symptoms for the disease. However, within 2 to 12 weeks of exposure to the bacteria, a person may develop a primary infection to lungs. Incidentally, this infection is asymptomatic, meaning it does not produce not produce any symptom at all. A chest X-ray at this time shows no infection to lungs.^[5] Tuberculosis (TB) is a communicable disease caused by bacteria of the ‘tuberculosis complex group’ (mainly *Mycobacterium tuberculosis* [MTB] and rarely *M bovis*, *M africanum* and *M microti*).

The infection is transmitted from one person to another through invisible droplet nuclei which are generated when someone with active TB of the lungs or larynx coughs, sneezes, spits, laughs or talks. Active TB may also occur in sites outside the airways but transmission does not occur from these sites or is very uncommon (eg. discharging wounds or abscesses). Transmission is relatively insufficient (in comparison to highly

contagious diseases such as measles and chickenpox) and depends on the infectivity of the source case, as well as the amount of time spent in contact with others and the environment in which contact occurs. Conditions such as overcrowding in poorly ventilated enclosed spaces that are not exposed to sunlight (which kills MTB bacilli) greatly enhance the risk of transmission.

M bovis (acquired directly or indirectly from cattle) has historically been a significant cause of TB. When ingested in milk containing large numbers of organisms, *M bovis* may penetrate the gastrointestinal mucosa or invade the lymphatic tissue of the oropharynx. Human infection with *M bovis* has been largely eliminated in developed countries as a result of milk pasteurisation and bovine TB control programs.^[6]

2. METHODOLOGY

2.1. Study design

This study is a descriptive facility- based / cross_sectional study for all new positive cases among TB patients in Wad madani and Elmanagil T.B centers in Gezira state _Sudan.

2.2 Samples

Total coverage of all new positive smear TB patients transferred to Wad madani and Elmanagil T.B centers in Gezira state – Sudan, in the period from 1/7/2016 to 31/12/2016(about 6 months).and this may elides good outcome.

2.3 Data collection technique

structured questionnaire which was distributed for each patient infected with tuberculosis disease for the first time. It includes: more at high risk group and describing socioeconomic status for TB patients.

2.4 Data Analysis

The data analyzed using statistical package for social science (SPSS). The data presented as tables and figures.

2.6 Ethical Consideration

Consent of state ministry of health in Gezira state.

Consent of participants in data collection.

Consent of patients and strict confidentiality regarding patients information, such as name, full residential address and ways of transmission, was considered.

3. RESULTS

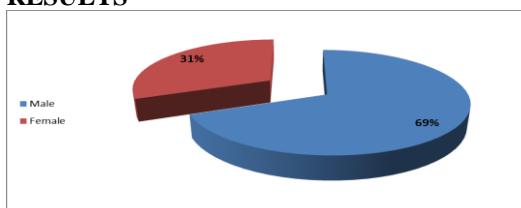


Figure 1: Gender distribution of new positive TB patients in wad madani & al managil centers – Gezira state-2018, (N=221).

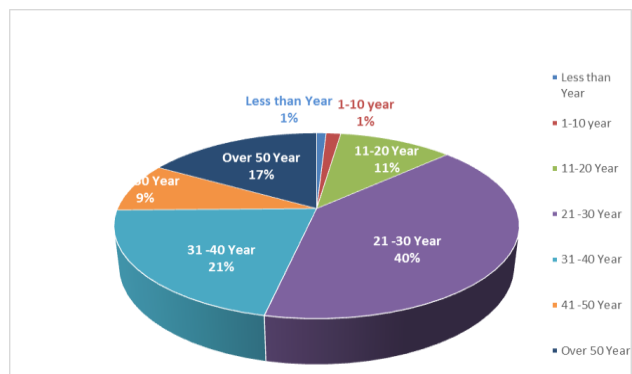


Figure 2: Age distribution of new positive TB patients in wad madani & al managil centers –Gezira state-Sudan-2018, (N=221).

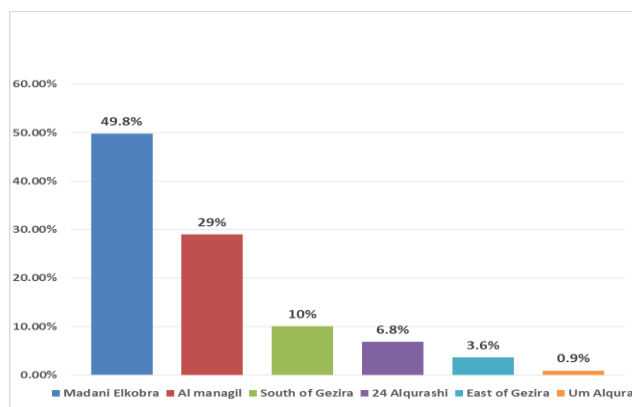


Figure 3: New positive TB patients distribution per localities in wad madani & al managil centers -Gezira state –Sudan-2018, (N=221).

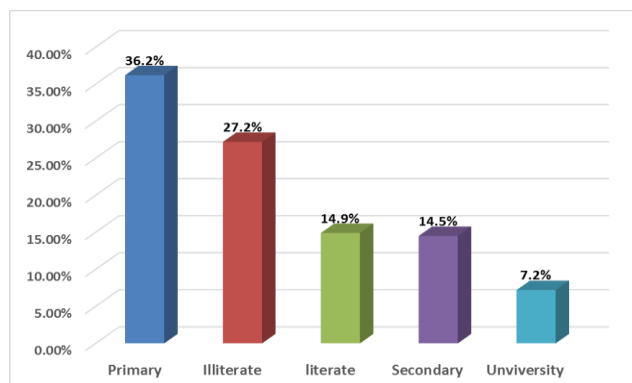


Figure 4: Percent of Education level for new positive TB patients in wad madani & al managil centers – Gezira state –Sudan- 2018, (N=221).

*Table 1: Shows marital status for new positive TB patients in wad madani & al managil centers - Gezira state -2018, (N=221).

Marital Status	Total	Percent%
Single	113	51.1
Married	101	45.7
Divorced	5	2.3
Widow	2	0.9
Total	221	100

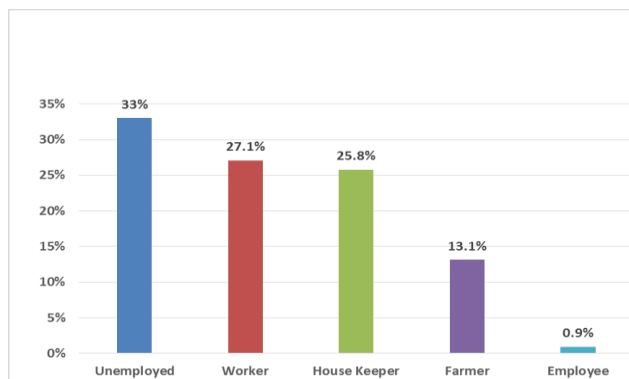


Figure 5: Occupation Percent for new positive TB patients in wad madani & al managil centers- Gezira state – Sudan- 2018, (N=221).

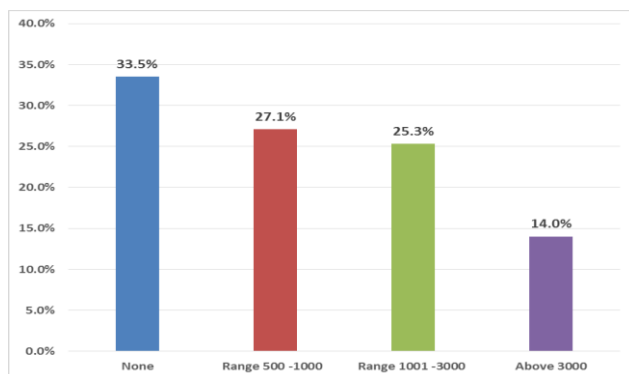
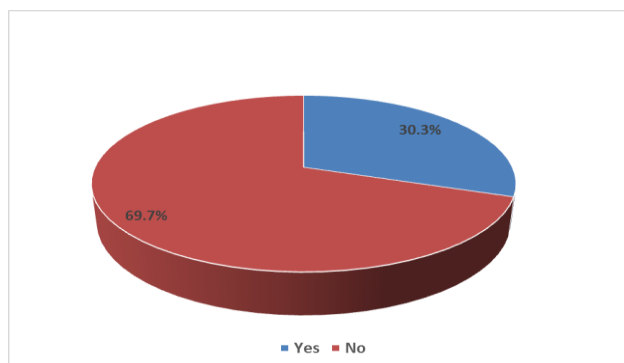


Figure (6): Percent of monthly income for new positive TB patients in wad madani & al managil centers -Gezira state - Sudan – 2018, (N=221).



Figures (7): Use of stimulants by new positive TB patients in wad madani & al managil centers -Gezira state - Sudan 2018, (N=221).

Table (2): Shows known comorbidity diseases of new positive TB patients in wad madani & al managil centers - Gezira state -2018: (N = 221).

known chronic diseases	Total	Percent%
Diabetes mellitus	8	3.6
HIV/ADIS	0	0
Cancers	0	0
Has no chronic disease	213	96.4
Total	221	100

4. DISCUSSION

The study indicated that the incidence rate in Wad madani center about (22 cases per 100.000 population), while the incidence rate in Al managil center estimate (11 cases per 100.000 population), Compare to total incidence rate in Gezira State (14 cases per 100.000 population) in year. WHO standard (86 cases per 100.000 population) in year .These incidence have indicated to poor detection rate in these centers and Gezira state generally.

The study reported that (69%) of the targets are male, The women about (31%). Indicating that men are most susceptible to tuberculosis disease than women. compare with previous study conducted in Eastern Sudan (Kassala Hospital)-2011- by researchers (Abdallah and Ali, 2012) has indicated to (63%) of the study group male, and (36,3) female(7). Compare also with previous study conducted in South India by (N.shetty et al.) has indicated (the sex distribution of the group was 58% men and 42% women(8), (Global Tuberculosis Report, 2014) has indicated that (Though most TB cases and deaths occur among men, the burden of disease among women is also high(9). In 2013, there were an estimated 3.3 million cases and 510 000 TB deaths among women, as well as an estimated 550 000 cases).

The study indicated that (74.7%) of the targets, in the age groups between 11 years and 40 year (product category more high risk), compare with previous study conducted in Kampala city (Uganda) by researchers (Kirenga et al, 2015) has indicated to (81%) of targets equal and less than 40 year(10).

The study showed that (7.2%) of targets received high level education {(14.5) secondary, (7.2)university}. compare with previous study conducted i in Kampala city (Uganda) by researchers (Kirenga et al, 2015) has indicated to (40.4%) of targets received high level education(10). And other study conducted in Iran by researchers (Ghaffari et al, 2015) has indicated to: (32.5%) were illiterate, (20%) were elementary and (20.5%) were guidance school (11). The study has indicated (33%) of patients un employed (highest category), (28.8) house keeper. (27.1) worker and employee (0.9%) as less category. Compare with previous study conducted in in Eastern Sudan (Kassala hospital)- 2011- by researchers (Abdallah and Ali, 2012) has indicated to(36.8) were non skills workers, (26.1%) skill workers, (25%)employees and (11.7%) were house keeper (7).

The study confirmed about (51.6%) of the targets have low income((33.5%) non and (27.1%) between 500 and 1000 SDG), That means these patients living below poverty line.(according to World Bank about 1.25 USD/day), While other study conducted in Rewa – India by researchers Aashutosh Asati and others, has indicated to: (61%) of patients were below poverty line(12), And other study conducted in Sudan –Khartoum state by

researcher (R. Khalid, 2014)(13) has indicated to : (23.8%) of the study participants were with monthly income less than 500 SDG, (32.8%) were within 500-1000 SDG, (30.9%) were 1001- 2000 SDG and (12.5%) were with an income of more than 2000 SDG per month(13). (H. Rieder et al) has indicated to (This leads to poor-quality and overcrowded housing or poor work conditions (14).

These may lower defenses as well as making infection more likely. People living in such conditions are often also poorly nourished. The whole complex of poverty makes it easier for the TB to cause disease.

The study confirmed (30, 3%) of the target use of stimulants (drugs, alcohol, cigarettes, snuff and others). About (17.6%) of the targets were smoking cigarettes, compare with previous study conducted in Georgia by (Madea a Gegia and others -2011 to 2013) has indicated to (45, 9%) current smokers and (31.8%) were past smokers(15). And other study conducted in Sudan – Khartoum state by researcher (R. Khalid, 2014)(12) has indicated to: out of the 272 participants, (23.9%) stated that they smoked cigarettes, (36.9%) were currently smokers, while (76.1%) had never smoked.

The study reported: A total of 221 participants were enrolled in this study including (3.6%) infected with diabetes, and (96.4%) did not infected with any chronic disease. compare with previous conducted in China by researchers (Liquan Zhang et al,2016), has indicated to: (22.9%)no infected, (40%) diabetes, (12%) liver diseases and (25%) others(16), While other study conducted in Rewa – India by researchers Aashutosh Asati and others, has indicated to: (7.6%) were HIV infected, (10.2%) patients had diabetes mellitus, (13.7%) were using corticosteroids for treatment of other chronic illness, (26.4%) were malnourished, (16.2%) had history of contacts with other pulmonary T.B patients, (3.4%) patients had chronic kidney disease, and (1.7%) had malignancy(12).

5. CONCLUSION

The present study reveals that various demographic, socioeconomic and environmental factors play a vital role in the etiology of pulmonary TB. Most important factor found were young age group, male gender, low socioeconomic status, exposure to TB infected patients, malnourishment and co-existing immune-compromised disease, Hence this study provides useful information about the epidemiological factors for new positive pulmonary TB that can used to control disease, by preventing these potential risk factor in population and timely diagnosis and providing treatment for pulmonary tuberculosis.

6. REFERENCES

1. O. Cosivi, J.M. Grange, C.J. Daborn, M.C. Raviglione, T. Fujikura, D. Cousins, R.A. Robinson,

- H.F.A.K. Huchzermeyer, I.de Kantor, and F.-X. Meslin *Emerging Infectious Diseases*, 1998; 4: 1.
2. WHO Tuberculosis Infection Control In The Era Of Expanding HIV Care And Treatment- -Limited Settings, 1999.
 3. Harms, Jerome Tuberculosis: Captain Death; <http://www.bact.wisc.edu/Bact330/lectureTB>, 1997.
 4. Medicines San Frontiers and Partners' in Health, Tuberculosis: Partical guide for clinical, nurses, laboratory technician and medical auxiliaries, 2014.
 5. Christine F. Sizemore D. Ritchard H. And Anthony S, National Institute of Allergy and Infectious Diseases. Available on lineat, 2011. <http://www.niaid.nih.gov/news/newsreleases/Pages/WorldTBDay>.
 6. CDC (2008) Guidelines for the Control of Tuberculosis in the Northern Territory- - 4th edition.
 7. Tajeldin M Abdallah, Abdel Aziem A Ali - Epidemiology of tuberculosis in Eastern Sudan - Asian Pac J Trop Biomed, 2015; 2(12): 999-1001.
 8. N. Shetty, M. Shemko M.Vaz, and G D'Souza An epidemiological evaluation of risk factors for tuberculosis in South India: a matched case control study - int j tuberc lung dis, 2006; 10(1): 80–86.
 9. Gezira state Report of Tuberculosis Control Program, Annual report, 2014.
 10. Bruce J Kirenga, Willy Ssengooba, Catherine Muwonge, Lydia Nakiyingi1, Stephen Kyaligonza, Samuel Kasozi, Frank Mugabe, Martin Boeree, Moses Joloba and Alphonse Okwera, Tuberculosis risk factors among tuberculosis patients in Kampala, Uganda: implications for tuberculosis control_ DOI 10.1186/s12889-015-1376-3.
 11. Ghaffari Fam S, et al, J Anal Res Clin Med, Epidemiological patterns of Tuberculosis disease in the Babol, Iran, 2015; 3(3): 164-9. doi: 10.15171/jarcm.2015.026, <http://journals.tbzmed.ac.ir/JARCM>.
 12. Aashutosh Asati, Shubhangi Nayak, Manoj Indurkar Assessment of Risk Factors among Pulmonary Tuberculosis Patients, 2017; 05: 05_ www.jmscr.igmpublication.org.
 13. Rashid Kamal Khalid Osman, Prevalence and risk factors of chronic obstructive pulmonary disease in past pulmonary tuberculosis patients, 2014.
 14. Hans L. Rieder, Chiang Chen-Yuan, Robert P. Gie and Donald A. Enarson Crofton's Clinical Tuberculosis - Third Edition- ISBN 978-1-4050-9737-6 Text and illustrations © International Union against Tuberculosis and Lung Disease Design © Macmillan Publishers Limited, 2009.
 15. Medea Gegia a, Matthew J Magee b, Russell R Kempker c, Iagor Kalandadzed, Tsira Chakhaiia a, Jonathan E Golub e & Henry M Blumbergc, Tobacco smoking and tuberculosis treatment outcomes: a prospective cohort study in Georgia University Research Company LLC Branch in Georgia, United States Agency for International Development Georgia Tuberculosis Prevention Project, Tbilisi, Georgia, 2015.

16. Liqun Zhang¹, Yu Pang, Xia Yu, Yufeng Wang, Jie Lu, Mengqiu Gao¹, Hairong Huang and Yanlin Zhao, Risk factors for pulmonary cavitation in tuberculosis patients from China _ Emerging Microbes & Infections, 2015; 110. doi:10.1038/emi.2016.111.