



## ORIGINAL ARTICLE

# Relationship between Nosocomial infections and Response to the Treatment of Tuberculosis in children

Sara Rahmati Roodsari<sup>1\*</sup>, Fariba Fayaz<sup>2</sup>

<sup>1\*</sup> Infectious Diseases and Tropical Medicine Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran. (corresponding author) e.mail: s\_r\_r85@yahoo.com

<sup>2</sup> Department of Microbiology, Faculty Of Medicine, Shaheed Beheshti University Of Medical Sciences, Tehran, Iran.

### ABSTRACT

*This research is aimed to determine the relationship between nosocomial infections & response to the treatment of tuberculosis in children. In this study we assessed 40 children with established tuberculosis infection. We divided the children into 2 Groups: Group A had T.B & nosocomial infections (N=20) and Group B had T.B infection alone (N=20). Survival of children in both groups were studied and compared during 1 year (October 2006 Since October 2007). Survival was 14 in Group A & 20 in Group B ( p value : 0.02 ). Nosocomial infections can lead to poor response to anti-tuberculosis treatment & more deaths in children. These Results need to be confirmed with more studies*

**Key words:** Tuberculosis (TB), Nosocomial infections

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### INTRODUCTION

Nosocomial infections are the infections acquired during hospital stay [1,2]. These infections concern 5-15% (estimated 2 million cases annually) of hospitalized patients and can lead to complication in 25-33% of those admitted in Intensive care units (ICU). Despite overall progress, hospital acquired infections (HAI) are a problem in both developed and developing countries. These are an important cause of death (80,000 deaths annually) and economic cost of additional stay in hospital, drugs, delayed discharge, etc. About 25% of the infections can be prevented by health care workers taking proper precautions when caring for patients [1,3].

Historically, Staphylococci, Pseudomonas and Escherichia-coli are the most common causes of nosocomial infections.

In the last decade tuberculosis (TB) has reemerged as a major world public health hazard with increasing incidence among adults and children. Although cases among children represent a small percentage of all TB cases, infected children are a reservoir from which many adult cases will arise. TB diagnosis in children usually follows discovery of a case in an adult since 1997, when the first global surveillance of tuberculosis (TB) drug resistance was reported, data on the threat that drug-resistant TB poses to TB control internationally have been growing [9-11] multi drug resistant TB (MDR-TB), defined as a resistance to the two most important anti-TB drugs, Isoniazid and rifampicin, has been found in all regions surveyed and is at critical levels in some areas. Very little is known about the effect of nosocomial infections on TB Treatment. In this study we compared the children by TB and nosocomial infections (Group A, no:20) with the children infected by TB alone (Group B, no:20).

### MATERIALS AND METHODS

This study was done between October 2006- October 2007 at Loghman hospital, where children and adults with pulmonary diseases such as suspected TB are admitted. The children who were selected for this research were 40 children between the age of 1 to 10 years old. We compared the children infected by TB and nosocomial infections (Group A, N:20) With the children infected by TB alone (Group B, N: 20).

Diagnosis of TB was made by history of close contacts with infectious TB, positive tuberculin skin test, positive culture, clinical signs and symptoms and radiologic findings. All patients were treated with the standard six-month regimens based on an initial 2-month intensive "bacterial phase" of INH, RMP, PZA and either STM or ETB, followed by a "continuation phase" of INH and RMP for 4 months [5,6].

Diagnosis of a nosocomial infection is based on:

- Symptoms and signs of infection
- Examination of wounds and catheter entry sites
- Review of procedures that might have led to infection
- Laboratory test results such as CBC, blood culture, urine culture, ... (1,3)

The patients with nosocomial infections were treated with antibiotics or other medication that kills the responsible microorganism.

The children who have had both criteria of TB and nosocomial infections were put in Group A.

Survival was the outcome measure.

## RESULTS

The bacteria responsible for nosocomial infections are shown in table I. Staph. aureus (frequency: 35%) & Pseudomonas aeruginosa (Frequency: 35%) are the most common causes of nosocomial infections in our study.

Main differences between group A&B is shown in table II. statistical analysis was performed using the X<sup>2</sup> test with a p value less than 0.05 regarded as significant. Survival was 14 in Group A & it was 20 in Group B (p value: 0.02)

Positive Tuberculin test was 15 in Group A and 20 in Group B (P value: 0.047)

Symptoms and signs suggestive of TB was 18 in Group A and 20 in Group B (P value: 0.487)

Positive TB culture was 15 in Group A and 18 in Group B (P value: 0.407)

## DISCUSSION

In our study the most common causes of nosocomial infections were Staph. aureus & Pseudomonas aeruginosa which was the same as the other studies. Nosocomial infections may lead to poor response to the treatment of TB as survival in Group A had a significant difference with Group B (P value: 0.02).

As we searched there was no study about the relationship between nosocomial infections & response to the treatment of T.B. so we couldn't compare our study with the others about the survivals, but to prevent and control this emerging situation, we need to increase national surveillance so that interhospital comparisons are valid, develop more noninvasive infection-resistant devices, and work with health-care workers on better implementation of existing control measures or admitting the TB patients in a specialized TB hospital.

**Table I: Pathogens responsible for nosocomial infections in Group A**

Pathogen	Frequency	Percentage
Staph.aureus	7	35%
Pseudomonas Aeruginosa	7	35%
Klebsiella sp.	4	20%
E.coli	2	10%
Conclusion	20	100%

**Table II: Main Differences between Group A&B**

Characteristic	Group A	Group B	P value
Survival	14	20	0.02
Symptoms & signs suggestive of T.B at admission	18	20	0.487
Positive TB culture at admission	15	18	0.407
Positive Tuberculin test	15	20	0.047

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