

The Role Of ICU in TB Management

Menaldi Rasmin

Robert Koch & Tuberculosis

1843-1910



Robert Koch - Founder of Modern Bacteriology :

Bacillus anthracis, 1877

Mycobacterium tuberculosis, 1882

Vibrio cholerae, 1883



The Epidemiology and Outcome of Prehospital Respiratory Distress

Matthew E. Prekker, MD, MPH, Laura C. Feemster, MD, MS, Catherine L. Hough, MD, MS, David Carlbom, MD, Kristina Crothers, MD, David H. Au, MD, MS, Thomas D. Rea, MD, MPH, and Christopher W. Seymour, MD, MSc

Abstract

Objectives: Patients with respiratory distress often seek emergency medical care and are transported by

166.908 EMS encounters:

19.858 : Respiratory Distress (RD) (11,9% ; 95% CI: 11,7-12,8%)

9.964 (50%) → hospitalized

3.094 (30%) – required Intensive Care

948 (10%) – died prior to discharge

1.501 (15%) – received invasive MV

among prehospital respiratory distress patients admitted to the hospital were congestive heart failure (CHF; 16%), pneumonia (15%), chronic obstructive pulmonary disease (COPD; 13%), and acute respiratory failure (13%). Few EMS patients with respiratory distress were coded with a primary diagnosis of acute myocardial infarction (3.5%, $n = 350$) or underwent percutaneous coronary intervention (0.7%, $n = 71$). In a multivariable regression model, prehospital factors that were independently associated with hospital admission included initial respiratory rate (odds ratio [OR] = 1.29 for an increase in respiratory rate of five breaths/min, 95% CI = 1.24 to 1.35) and an encounter that originated at a nursing home (OR = 2.80, 95% CI = 2.28 to 3.43).

Conclusions: In a population-based cohort, EMS personnel commonly encounter prehospital respiratory distress among medical patients, many of whom require hospital admission to the intensive care unit. These data may help to inform targeted therapy or more efficient triage and transport decisions.

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Delayed Diagnosis of Active Pulmonary Tuberculosis in Emergency Department

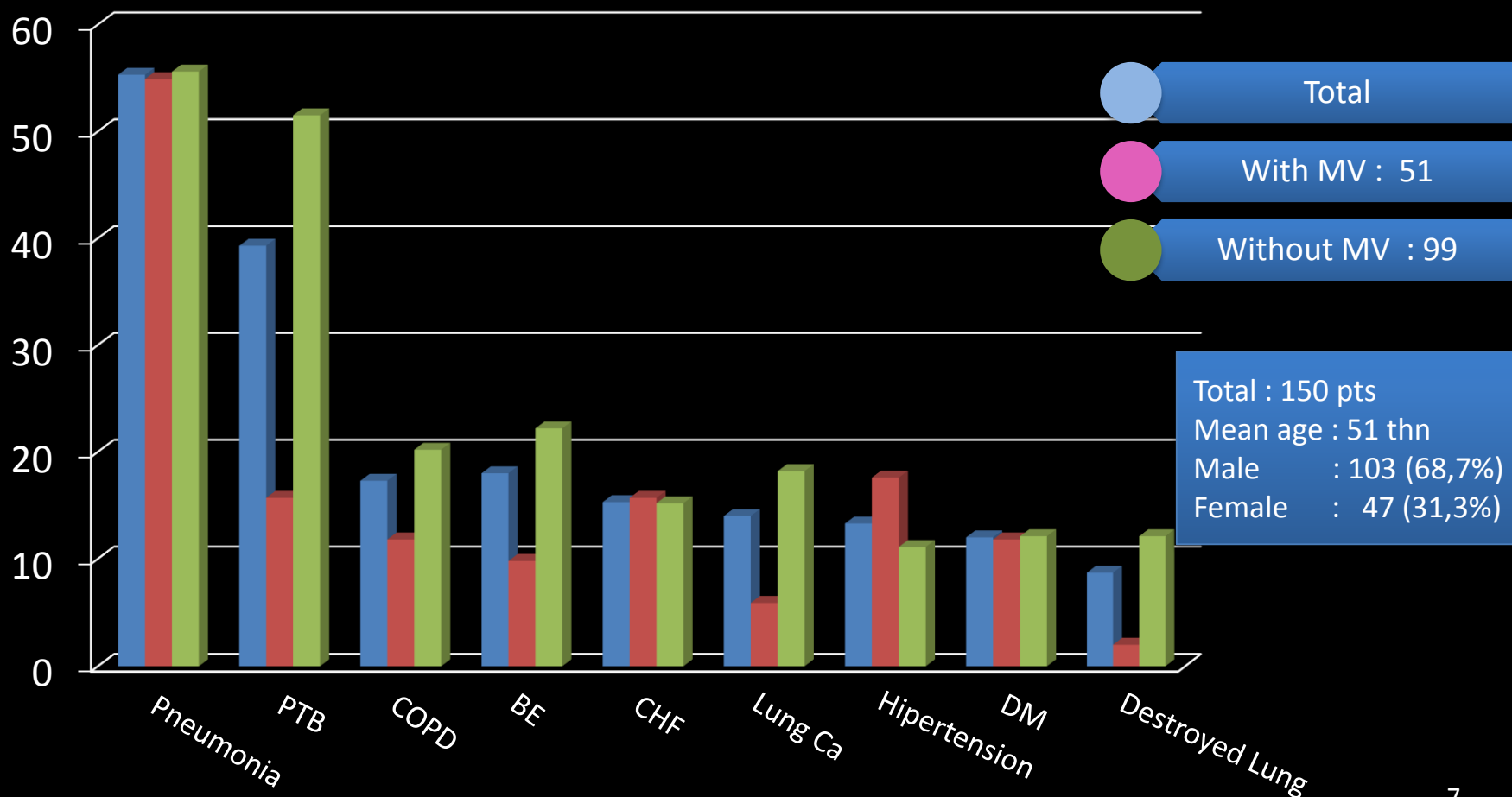
Tsai TC, Hung MS, Chen IC, Chew G, Lee WH
American Journal of Emergency Medicine 2008;26:888-892

	NonDelayed TB Group	Delayed TB Group	
Typical CXR findings	79,8%	31,6%	p < 0,001
Pneumonia at ED	22,6%	68,4%	P < 0,001
Length of initiation of TB treatment	0 (0-1) days	9 (6-16) days	P < 0,001
In-Hospital Mortality Rate	15,5%	47,4%	P < 0,01
I C U Admision	Lower In-	Hospital Survival	

Conclusion : ICU Admission & Age are associated with mortality

10 Most Frequent Diseases With Acute Respiratory Failure

KARAKTERISTIK DAN KELUARAN PASIEN GAGAL NAPAS AKUT DI RSUP PERSAHABATAN TAHUN 2015
Rasmin M, Elhidsi M, Syahputra W



ICU & TB



PTB Diagnosis in the ICU

- Delayed diagnosis on ICU admission¹ :
 1. low yield of initial diagnostic tests
 2. nonspecific radiographic studies
 3. willingness of critical care staff to attribute overwhelming illness to more common conditions seen in the ICU
 4. empiric AB or immunosuppressive Th/ on nonTB
- Diagnosis may be confounded by atypical clinical presentation & the lack of sensitive and rapid diagnostic tests² :

161 tracheal aspirate only 48 (30%) AFB stain positive,
80 (69%) were culture positive
- GenXpert should be chosen where available³

1. Eveloff SE, Donut WE, Braman SS. Occult Tuberculosis in the Intensive Care Unit. J Intensive Care Med 1994; 9:64-70

2. Alshimamari AA, Arabi YM, Al-Jahdali H, Olayan A, Harbi OA, Memish Z. Clinical Presentation and Outcome of Patients Diagnosed With Active Pulmonary Tuberculosis in A Large Critical Care Unit. Crit Care & Shock 2011;14:1-6

3. Calligaro JL, Theron G, Khalfey H, Peter J et al. Burden of tuberculosis in intensive care units in Cape Town, South Africa, and assessment of the accuracy and effect on patient outcomes of the Xpert MTB/RIF test on tracheal aspirate samples for diagnosis of pulmonary tuberculosis: a prospective burden of disease study with a nested randomised controlled trial. www.thelancet.com/respiratory/August 2015;vol.3

The Role of Thoracic Imaging

- Portable Chest Radiography (CXR) : the most common radiography examination requested¹
- CXR does not contribute as much as expected in the clinical diagnosis and suspicious of PTB in the ICU setting²
- Different features of TB patients in the ICU may be easily misled³
- Thoracic CT-scan : detects pathology not visible on conventional portable CXR¹

1.Rubinowitz AN,Siegel MD,Tocino I. Thoracic Imaging in the ICU. Crit Care Clin 2007;537-579

2.Wu JY,KuSC,Shu CC,Fan JY et al. The Role of Chest Radiography in the Suspicion For and Diagnosis of Pulmonary Tuberculosis In the Intensive Care Units. Int J Tuberc Lung Dis 2009;13(11):1-7

3.Hashemian SMR,Jamaati H,Tabarsi P,Karam MB et al. Radiologic Manifestations of Pulmonary Tuberculosis in ICU. International Journal of Mycobacteriology;2015;4:9

AKURASI SISTEM SKORING CT-SCAN TORAKS TANPA KONTRAS POTONGAN TERBATAS UNTUK MENEGAKKAN DIAGNOSIS TUBERKULOSIS PARU DEWASA

DISERTASI
AZIZA GHANIE ICKSAN
2014

Subjek : 130 pasien diduga TB, BTA Negatif
84 pasien dinyatakan TB dibandingkan dg rujukan standar

Sistem Skoring : usia, riwayat merokok, kontak TB serta 9
karakteristik kelainan utama pada CT-scan Toraks
potongan terbatas

Kesimpulan : Sistem Skoring CT-scan Toraks tanpa
kontras potongan terbatas mempunyai akurasi
yang setara dengan rujukan standar untuk
menegakkan diagnosis TB paru dewasa

Outcome of TB patients Requiring ICU

- A very high mortality rate among acute pulmonary TB (APT_B) patients in the ICU^{1,2,3,4}
- Predictive factors : miliary PT_B, mechanical ventilation & vasopressor requirement on admision⁴
- SAPS (Simplified Acute Physiology Severity)-II significantly associated with mortality⁵

1. Mansour M, Madkour A, Fouda M. Outcome of active pulmonary tuberculosis patients requiring intensive care admission. *Egyptian Journal of Bronchology* 2014;8:79-86
2. Balkema CA, Irušen EM, Eljaard JJ, Koegelenberg JJ. Tuberculosis in the intensive care unit : a prospective observational study. *Int J Tuberc Lung Dis* 2014; 18(7): 824-30
3. Hagan G, Nathani N. Clinical Review : Tuberculosis on the Intensive Care Unit. *Critical Care* 2013;17:240
4. Valade S, Raskine L, Aout M, Malissin I et al. Tuberculosis in the Intensive Care Unit. A Retrospective Descriptive Cohort Study With Determination of a Predictive Fatality Score. *Can J Infect Dis Med Microbiol* 2012;23(4):173-178
5. Lanoix J-P, Gaudry S, Flicoyeaux R, Ruimy R, Wolff M. Tuberculosis in the Intensive Care Unit: A Descriptive Analysis in a Low-Burden Country. *Int J Tuberc Lung Dis* 2014; 18(5):581-7

Mortality of PTB in ICU

- In-Hospital Mortality¹ : 25,9 % > 22,4 % in ICU
Mean : 53,6 days (50% within the first 32 days)
Independently associated Risk Factors : Acute Renal Failure, need for MV, chronic Pancreatitis, sepsis, ARDS, nosocomial pneumonia
- RICU²
 - Mortality Rate : 74%
 - Medial Length of Stay : 5 days
 - Respiratory Failure: the most common cause of admission
 - MV : 65%
 - complication : in 45% of pts
 - nonsurvivors : female, lower diastolic BP, far advanced lesion, Type-II RF, higher APACHE-II Score, lower GCS Score, increased need for MV, electrolyte disturbance

1. Erbes R, Oettel K, Raffenberg M, Mauch H, Schmidt-Ioannas M, Lode H. Characteristics and Outcome of Patients With Active Pulmonary Tuberculosis Requiring Intensive Care. Eur Respir J 2008;27: 1223-1228

2. Mansour M, Madkour A, Fouda M. Outcome of active pulmonary tuberculosis patients requiring intensive care admission. Egyptian Journal of Bronchology 2014;8:79-86

RICU : One Step of Solution

- More than 35% ICU pts : purely respiratory cases
- Respiratory failure in Pneumonia is 34,8%
- Shortening time to ICU,
since >75% pts come from the ward and,
> 15% pts from EU
- ICU's outcome :
 shortening LOS pulmonary pts 1-3 days
(43,8%) shortening the use of MV, 1-3 days
(70,69%)

TB Management & the ICU

- EU : Respiratory distress → Beware of TB
Dx: Comprehensive Anamnesis & PE
CXR
AFB- (genXpert + smear)
Consider directly to RICU
- RICU : repeat Dx procedures for TB
analysis for fatality risk factor
consider anti-TB medication

Ethical Issues

a. Doctor's Competency & attitude to the patient

(ct. careless, dishonesty, information openness)

b. Business practice

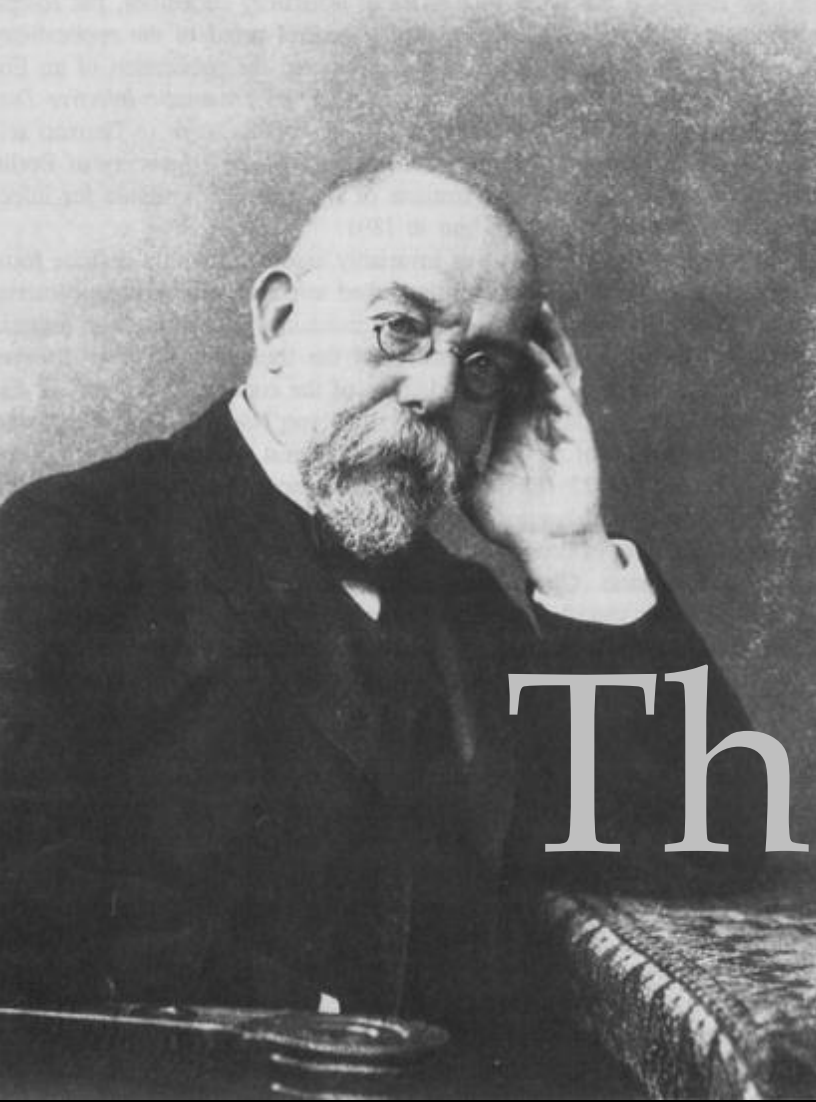
(ct. billing system, reporting, documentation)

c. Professional practice

(ct. willingness to refer patient, the chance to work in a proper competency, nonprofessional relationship)

Ethical Issues

- *Patient safety is the absence of preventable harm to a patient during the process of health care (the coordinated efforts to prevent harm, caused by the process of health care itself, from occurring to patients)*
- Hippocrates :
....." In Arts there are diseases, the diseased and doctors. Doctor is the servant of the Arts"



Thank You