

Diagnostic value of

ADENOSINE
DEAMINASE

in TB pleural effusions

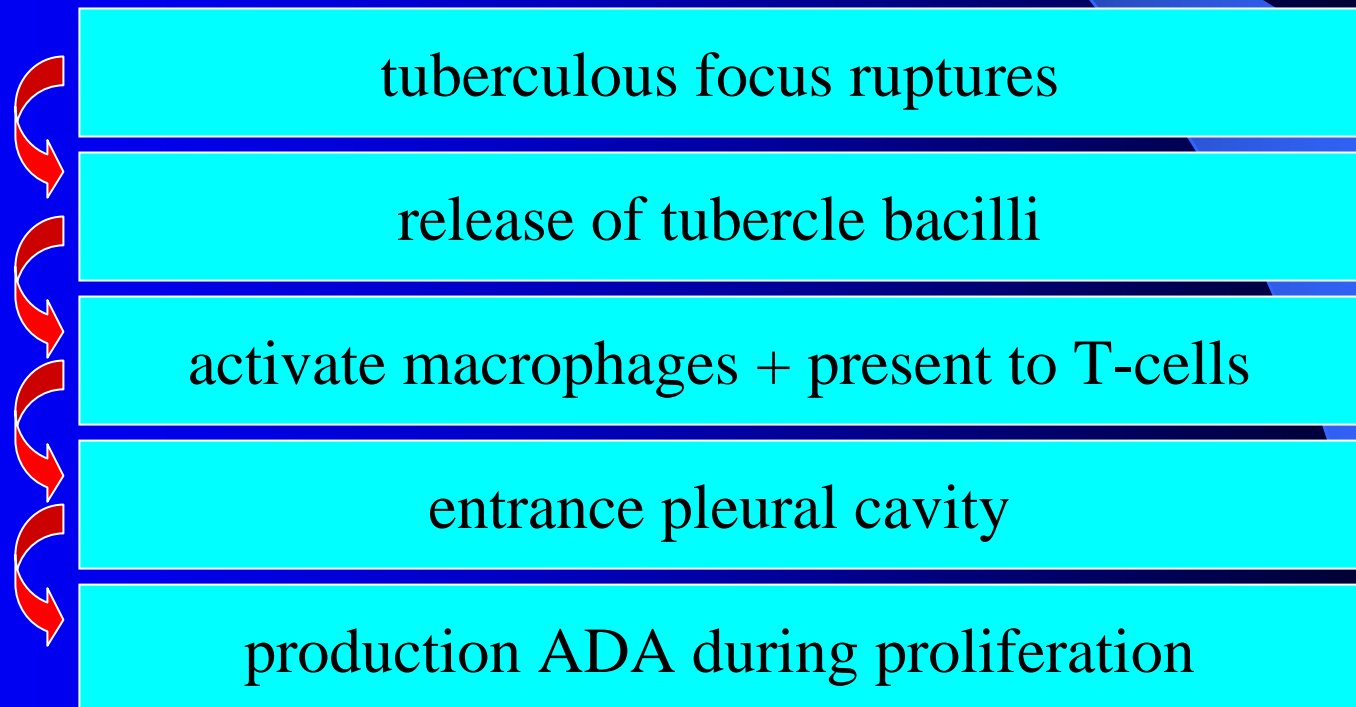
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Introduction

- Pleural TB is present in 4% of all TB cases ⁴
- Resolves spontaneously vs progressive disease / high recurrence rate ⁴
- Diagnosis of TB pleuritis is difficult: ^{1,3,4}
 - Non-specific clinical presentation
 - Insufficient efficiency diagnostic methods:
 - Pleural biopsy often requires several attempts, results of histology and culture → diagnosis in 85%
 - Thoracoscopy is most accurate + expensive

Adenosine Deaminase (1)

- Effusion is result of delayed-type hypersensitivity reaction of T-cells ⁴



Adenosine Deaminase (2)

- Enzyme that catalyses the deamination of adenosine and deoxyadenonise ^{1,3,4}
- Found in most cells
- 2 isoenzymes: ³

ADA-1 : found in many tissues

ADA-2 : > major component of total ADA activity
> greatest affinity for adenosine
> found only in macrophages
> release when entrance micro-organism

Adenosine Deaminase (3)

- High levels ADA in effusions due to: ^{1,3,4}
 - TB
 - Bacterial infections
 - Rheumatologic diseases
 - Lymphoproliferative disorders
- Determination of the isoenzymes of help in distinguishing ³

Research (1)

- Existing diagnostic methods insufficient efficient or expensive
- Sensitivity / specificity using ADA in detecting tuberculosis in pleural effusions
- Tygerberg research, '03
 - 51 pt undiagnosed exudative pleural effusions
 - Prospective, direct comparison between pleural microbiology and biochemistry (ADA), closed needle biopsy and thoracoscopy.
 - Sensitivity combined histology / culture:
closed needle biopsy 79 %, thoracoscopy 100%.
 - Sensitivity pleural fluid ADA of >50 U/L 95%, specificity 89%

Research (2)

- Sensitivity + specificity ADA in diagnosing TB in pleural effusions

	Cut-off value (U/L)	Sensitivity (%)	Specificity (%)
Review articles ^{4,5}	40 – 55	85 – 100	80 – 95
ADA-2 ³	40	100	96
Tygerberg ¹	50	95	89



Discussion

- False-positive results are relatively high, due to empyema, and in low-prevalence TB countries
- Drawback of relying on ADA alone: adding cytology and bacterial culture increase the values
- South-Africa: Effect of HIV on ADA-activity

Conclusion

- Combination of:
 - Pleural fluid adenosine deaminase
 - Closed needle biopsy, for histology and culture
- Has a high diagnostic accuracy in undiagnosed pleural effusions in areas with high TB-incidences. ^{1,2,3,4,5}
- Substitution for thoracoscopy at lower expense in poor countries
- Most of the studies are on total ADA level; ADA isoenzymes may be more accurate. ³

Literature

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3. Merrikhi A., *Diagnostic value of ADA Activity and its isoenzymes in tuberculous effusions*, 2001
4. Mo-lung Chen et al, *Diagnostic value of pleural fluid ADA activity in tuberculous pleurisy*, 2003
5. Verma M. et al, *Study of ADA activity in pulmonary tuberculosis*, 2004

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Remember...

- Maastricht
- Amsterdam

