

SUPPLEMENTARY MATERIAL

Diagnostic predictors of tuberculosis in exudative pleural effusion patients with intermediate adenosine deaminase values: a retrospective diagnostic prediction model study

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Supplementary Table 1. Patient demographics and clinical characteristics.

Variable	TB (n=77)	Non-TB (n=48)	p
Age (years), median (IQR)	35 (27–49)	63 (55–70)	0.003
Gender (M/F), n (%)	47/30 (61/39)	29/19 (60/40)	0.89
Current/former smoker, n (%)	19 (25)	18 (38)	0.12
Indoor pollution exposure, n (%)	34 (44)	21 (44)	0.99
Duration of symptoms (days), median (IQR)	21 (14–35)	28 (18–45)	0.19
Symptoms, n (%)			
Cough	69 (90)	35 (73)	0.016
Shortness of breath	59 (77)	38 (79)	0.74
Fever	44 (57)	15 (31)	0.003
Chest pain	30 (39)	20 (42)	0.71

Supplementary Table 2. Biochemical characteristics of pleural fluid.

Variable	TB (n=77)	Non-TB (n=48)	p value
ADA (IU/L), median (IQR)	48.3 (44.1-53.2)	43.6 (40.2-47.8)	0.001
Protein (g/dL), mean $\pm$ SD	5.42 $\pm$ 0.92	4.91 $\pm$ 0.81	0.002
Albumin (g/dL), mean $\pm$ SD	2.51 $\pm$ 0.62	2.28 $\pm$ 0.76	0.08
Glucose (mg/dL), median (IQR)	68 (58-78)	72 (62-82)	0.42
LDH (IU/L), median (IQR)	285 (248-342)	312 (268-385)	0.28
Lymphocytes (%), median (IQR)	78 (68-88)	72 (58-82)	0.24

Supplementary Table 3. Univariable ROC analysis for diagnostic predictors.

Variable	AUC (95% CI)	p	Sensitivity at optimal cut-off (%)	Specificity at optimal cut-off (%)	Youden index
ADA (IU/L)	0.72 (0.62-0.82)	0.001	70	65	0.35
Age (years, inverted)	0.81 (0.72-0.90)	0.003	74	77	0.51
Protein (g/dL)	0.65 (0.54-0.76)	0.002	68	60	0.28
Albumin (g/dL)	0.58 (0.45-0.71)	0.08	61	54	0.15
Glucose (mg/dL)	0.49 (0.36-0.62)	0.81	45	63	0.08
LDH (IU/L)	0.48 (0.35-0.61)	0.62	43	71	0.14
Lymphocytes (%)	0.53 (0.41-0.65)	0.58	56	60	0.16

Supplementary Table 4. Multivariable logistic regression model.

Predictor	Coefficient (β)	Standard error	Odds ratio (95% CI)	p
ADA (per 1 IU/L increase)	0.215	0.042	1.24 (1.14-1.35)	<0.001
Protein (per 1 g/dL increase)	0.500	0.168	1.65 (1.19-2.29)	0.003
Age (per 1-year increase)	-0.073	0.018	0.93 (0.89-0.97)	<0.001
Constant (intercept)	-7.851	2.34	—	<0.001

Supplementary Table 5. Performance comparison: ADA-alone vs. multimarker model.

Performance metric	ADA-alone	Multimarker model	Absolute difference	% relative improvement
Sensitivity (%)	70	89	+19 pp	+27%
Specificity (%)	65	79	+14 pp	+22%
Positive predictive value (%)	74	84	+10 pp	+14%
Negative predictive value (%)	57	86	+29 pp	+51%
Overall classification accuracy (%)	68	85	+17 pp	+25%
AUC (95% CI)	0.72 (0.62-0.82)	0.89 (0.83-0.95)	+0.17	+24%

Supplementary Table 6. Internal validation: 10-fold stratified cross-validation.

Metric	Fitted model	10-fold CV mean	CV SD	Overfitting (optimism)
AUC	0.89	0.87	0.04	0.02
Sensitivity (%)	89	86	4.2	3 percentage points
Specificity (%)	79	77	5.1	2 percentage points
Overall accuracy (%)	85	82	4.8	3 percentage points