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Research Article

Investigate relationship between ADA and PCR for TB in bronco alveolar lavage and various pulmonary disease

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ABSTRACT:

Back ground: ADA is a hydrolytic catalyzer enzyme that it is irreversible responsible for converting inosine to adenosine. The sputum smear negative of patients has been a diagnostic challenge for health professionals. ADA has been shown to rise in BAL of patient, with TB. PCR is a molecular technique, it can detect a low of microorganism. This study was conducted to determine the diagnostic value of ADA &PCR in BAL fluid in various lung diseases.

MATERIAL and Method: A cross sectional study was conducted in ShahrekordHajar hospital in iran.100 patients enrolled in our study (62 females,38male). These patients were admitted in hospital. we did bronchoscopy with BAL then we sent ADA& PCR for TB laboratory.

RESULT: 100 patients were studied (9 with TB,39 with pneumonia,11with primary lung malignancy,9 with metastases to lung,8 with bronchitis). Patients with TB the level of ADA were not significantly elevated in fluid of BAL. ADA increased significantly in patients with pneumonia (P=0/95). PCR was positive in TB and other lung diseases but in TB it significantly increased. (p=0/021)

Discussion: It is seen that the measurement of ADAin diagnosis of TB or lung cancer dos not help us but It is difficult to diagnose that positive PCR in negative smear in clinically &laboratory test. But other factors can effect on my results, for example epidemiologic situation, measurement ADA2 replacement of total ADA.

Key word: Bronco alveolar lavage, adenosine deaminizes, polymerase chain reaction, Bronchoscopy

INTRODUCTION:

ADA is the key enzyme in purine metabolism [(1)]. ADA is a hydrolytic catalyzer enzyme that it is irreversibly responsible for convertinginosine to adenosine [(2)]. ADA helps differentiation of tissues particularly inhuman's lymphocyte in [(3)].ADA can increased in TB effusion.TB is the second infective etiology mortality in the word, but we have many problems in diagnostic for TB particularly negative smear TB.Bronchoscopy is a method that is used for diagnoseof various pulmonary diseases.It enters frommouth or nose to lung [(4)]BAL is a technique for elevation diagnosed in pulmonary diseases, the physion injects normal saline to brunch then aspirates it [(5)].PCR is a rapid technique for replication of DNA and it is a fast method for diagnosing TB but it is not cost benefit. It isused to amplify a few copies or many copies of DNApieces across several ordersof generating thousands and millions of copies of a particular DNA sequence[(6)].The few studies evaluated BAL fluid ADA and PCR these to diagnose TB or lung malignancy,but we evaluate this markers for various pulmonary diseases.This study investigates ADA, PCR, for TB and malignancy in BAL fluid.

MATERIAL AND METHODS:

A cross sectional study was performed at HajarShahrekord hospital between 2013-2015 in Iran. 100 patients with various respiratory symptoms admitted to hospital,they had indication for bronchoscopyAnd bronchoalveular lavage were. we sent samples of ADA and PCR for TB.exclusion criteria included as follows [7]:

1) They have contraindication such as hypoxemia, MI, recentangina, respiratory failure, incompatibility patient,tracheal obstruction.
2) history of alcoholabuse, known case of malignancy liver disease

After bronchoscopy and performing BAL Samples were sent to laboratory test for evaluation ADA levels and PCR in BAL fluid wecompared them ADA kit.ADA investigated by ADLS2210 (ADA liquidstat) Reagent kit. We fallowedpatients and we did some necessary diagnostic evaluation (CXR, CT scanbronchoscopy,AFB) to diagnose various pulmonary diseases then patients divided in six groups.The aim of this study is investigate relationship between ADAand PCR in BAL and Various pulmonary diseases.Spss16 wasused forthe analyticalstatically of the data.

RESULTS:

100 patient enrolled to study 63females ,27 males with minimum age 13, maximum age 84. Mean, median,Standard-deviation of age respectivelywas 57,53,19. The prevalence symptom was in 100 patient dyspnea (67), dry cough (31), productive cough (26), dysphonia (1), fever (11), chest pain (5). We compared patients based on symptoms of prevalence and found diagnose of pulmonary disease. They have been shown in Table 1. Mean, medium, standard deviation was respectively for ADA 4/18, 4, 4/7. minimum level for ADA 0/7 and maximum was 0/37.Our results including mean, medium, standard deviation of ADA have shown separately it has been shown in table 2 and diagram 1. We regarded normal cut ofa pointed for ADA<3/5. We divided patient in 6 groups: 1) 6 patient had TB 2) 39 pneumonia 3) 11 primary lung cancer 4) 9 metastases to lung 5) 8chronicbronchitis 6)27 other patient with cardiac and respiratory diseases. We measured level of ADA and PCR for TB in BAL 100 patients thenwe comprised the results.We usedSmirnoff testbecause there were not normal distributions for ADA. Mann Whitney test ADA in TB group (9)and other groups (91) there were not significantly different.(P=0/14),primary lung malignancy (11).(P=0/19),metastasesto lung (9).(P=0/16),combination of two groups metastases and primary cancer (20),(P=0/73).chronic bronchitis (8), (P=0/93).We found ADA in pneumonia significantly is different from other groups, (P=0/95). Finding in showed that ADA can be elevated by pneumonia infection of lung parenchyma (table 2)Resultsshowed 86patientshad negative PCR and 14 patients with positive PCRin TB (9), 4patients had positive PCR (44/4) and 5 negative PCR (55/5), in other groups (91) 10 patient (11/1) had positive PCR and 81 patients (88/9) with negative PCR. Thisfinding show a significant relationship between TB and positive PCR (P=0/021).Positive PCR or increasing ADA more than cut of point (>3/5) only found in 5 patients include 1 patient among (9) patient with known case TB,4 patients without TB.IT showed there was not significant different between TB and other groups,we cannot use aloneto diagnose TB (table 3)

DISCUSSION:

The finding showed a significant different in ADA levels, in pneumonia groups,compering other groups. butthere was not any relationship between TB and other groups in ADA level BAL fluid. In the study Reechaitichikal et al, compared ADA levels in BAL fluid of pulmonary TB,lung cancer, and other pulmonary disease, they did not find significant difference among these groups

(P=0/56) [3]. ButBanish et al study showed ADA level hasa significant difference in TB patients and other pulmonary diseases and control groups[8].Kubata et al showed min ADA in BAL in Millry to more than from other groups(P<0/01) [9]. Orphanidu et al determined activity of ADA &Lyzosyme negative smear patient with TB and other pulmonary disease in BAL they seen that ADA significantly raised in BAL of patient with TB(p=0/001) [10]. Our resultsthe demonstrated positive PCR in non TB diseases, but there a significant different between TB and non TB groups (P=0/021).Boonsarangsuk et al showed ADA activity of TB cases was significantly different from that of other patients with pulmonary disease (p<0/001). Differentiation of TB from solid tumorwas significantly higher for combination of ADA activity >3 andTB PCR (0/7)than ADA alone (p<0/001),or TB PCR alone (p<0/001), it showed sensitivity 72% in combination of two tests but sensitivityalone for ADA was 58/7% and PCR sensitivity alone was 28/1% [11]. However other studies showed different results, the etiology can be low or high TB incidence regions or measurement ADA_2instated total ADA because ADA2 has an important roleto stimulate ion t-lymphocyte it results increasingADA_2.also cellular differentiation in BAL can be important in etiology because increasingT-lymphocyte in BAL can show increasing ADA in BAL.it seems that this laboratory assessment is remarkably depended on the method of measurement location, it explains why results is different. According to interactive reaction ADA with other serum protein,some researchers suggest the level of ADA in BAL with serum ADA, serum albumin, albumin and urea in BAL should be corrected.

CONCLUSION:

In conclusion this study shows that ADA levels in BAL fluid do not help to us for TB diagnose it may be has a false positive in pneumonia, and other disease,but PCR for TB may help us for TB diagnose but no alone.It showed accompany with various other test. in this study showed ADA can not help us to diagnose TB, but positive PCR may be can help us besides other diagnostic evaluation tests.

	Number	DRY COUGH		DYSPNEA		PRODUCTIVE COUGH		HEMOMTESIA		FEVER		DYSPHONIA		CHEST PAIN	
		Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
TB	9	5 (%55.6)	4 (%44.4)	5 (%55.6)	4 (%44.4)	2 (%22.2)	7 (%78.8)	1 (%11.1)	8 (%88.9)	2 (%22.2)	7 (%78.8)	0	9 (%100)	0	9 (100%)
PRIMARY LUNG CANCER	11	0	11 (%100)	9 (%81.8)	2 (%18.2)	1 (%9.1)	10 (%90.9)	0	11 (%100)	0	11 (%100)	0	11 (%100)	2 (%18.2)	9 (%81.8)
METASTASE	9	5 (%55.6)	4 (%44.4)	6 (%66.7)	3 (%33.3)	2 (%22.2)	7 (%78.8)	0	9 (%100)	2 (%22.2)	7 (%78.8)	0	9 (%100)	1 (%11.1)	8 (%81.8)
METASTASE & LUNG CANCER	20	5 (%25)	15 (%75)	15 (%75)	5 (%15)	3 (%15)	17 (%75)	0	20 (%100)	2 (%10)	18 (%90)	0	20 (%100)	3 (%15)	17 (%75)
BRONCHITIS	8	1 (%12.5)	7 (%87.5)	6 (%75)	2 (%25)	4 (%50)	4 (%50)	2 (%25)	6 (%75)	0	8 (%100)	0	8 (%100)	1 (%12.5)	7 (%87.5)
PNEUMONIA	39	14 (%35.9)	25 (%64.1)	23 (%59)	16 (%41)	12 (%30.8)	27 (%69.2)	5 (%12.8)	34 (%87.2)	6 (%15.4)	33 (%84.6)	0	39 (%100)	1 (%2.6)	38 (%97.4)

Table 1: Prevalence of clinical symptoms patient separation of clinical diagnose

		Median	mean	standard deviation	P.Value	minimum	maximum
TB	Yes	3/6	3	2	0/4	1/4	8
	No	4/86	4	4/32			
PRIMARY LUNG CANCER	Yes	4/81	4	1/66	0/19	3	8
	No	4/74	4	4/39			
METASTASE	Yes	8	4	10/9	0/16	3	37
	No	4/32	4	2/73			
METASTASE & LUNG CANCER	Yes	6/25	4	7/36	0/73	3	37
	No	4/37	4	2/85			
BRONCHITIS	Yes	4	4	1/19	0/93	2	6
	No	4/81	4	4/34			
PNEUMONIA	Yes	4/03	4	1/9	0/95	0/7	11
	No	5/21	4	5/09			

Table 2: Median, mean, standard deviation, P. Value, minimum and maximum data rate of the ADA in lung disease

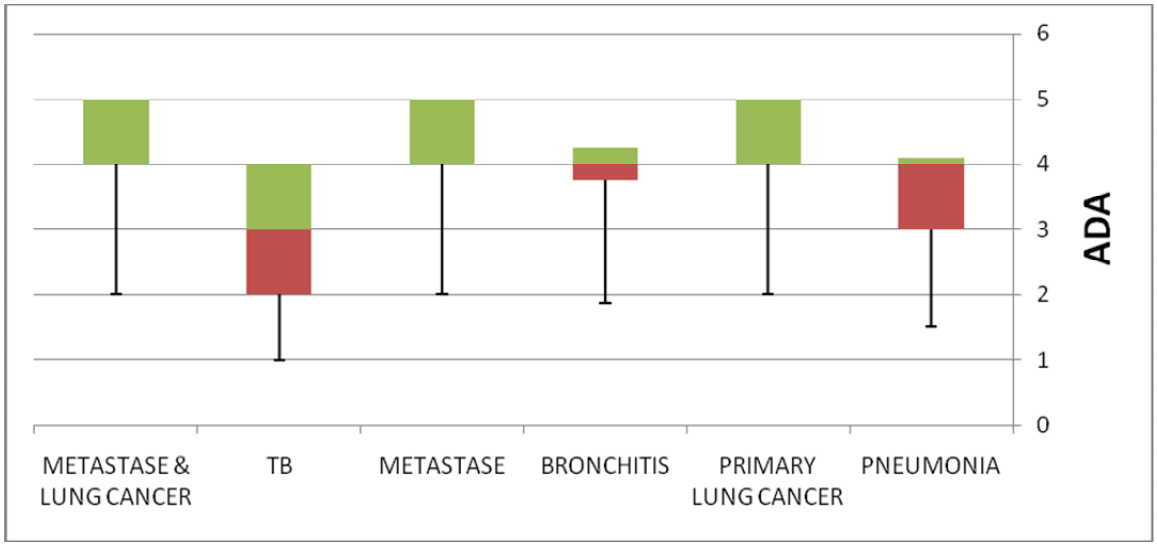

Diagram 1: Compare ADA's total and average of lung disease to diagnosis

Recognition	PCR	
	Positive	negative
Groups with TB	4 (% 44/1)	5 (% 55/9)
Other lung disease except TB	10 (% 11/1)	81 (% 88/9)
Total two groups.	14 (% 14/1)	86 (% 85/9)

Table 3. PCR results in TB and other lung disease

REFERENCE

1. 1-Wilson DK, Rudolph FB, Quiocho FA (May 1991). "Atomic structure of adenosine deaminizecomplexes with a transition-state analog: understanding catalysis and immunodeficiency mutations". Science 252 (5010): 1278–1284.
2. 2-Khalid Hassanein ,HossamHosny , Randamohammad. Role ADA in diagnose of pulmonary TB. Egyptian journal of Broncho logyvole4 No.1june 2010
3. 3-Reech uipichitkul w, etal, diagnostic yield of ADA in BAL, department of medicine, srinagarind hospital facility of medicine, khonkaen university, Thailand, soothes, Asian Trop med public Mealth 2004 sep: 35(3): 730-4
4. 4-Luis LadoLado F, Luisa Perez M, Ramon antunez R, etal. Conventional and current techniques for the diagnosis of tuberculosis. Nova science Publisher 2007; 149-172
5. 5-BritishThoracic society Bronchoscopy Guidelines committee, a subcommittee of the standards of care committee of British thoracic society; British thoracic society guidelines on diagnostic flexible bronchoscopy, thorax 2001; 56: (supple I) i1-121.
6. 6- Javadi.A, Barati.M, Kochari.M, etal. Investigate bronchial washing in smear & PCR for diagnosis of TB, 1391, NUN 105, Razi J 56-59
7. 7-Ernest A, introduction Bronchoscopy 2009 Cambridge University, the 2 Chapter 6-8-9. P 60:95
8. 8-FaribaBinesh, AbollhassanHalvani, predictive role of ADA in BAL fluid in making the diagnosis of pulmonary tuberculosisshahidsadoughi university of medical sciences, yazd, iran 2010.
9. 9-Kubota.Measurement of ADA in BAL fluid as atool for diagnosing miliary TB department of mnternalMedicianes School of medicine Kitasuto university kanayawayjapon. J Euro Pep Mc. 1996; 34(2): 739-44.
10. 10-Segura, R., Pasqual, C., Oceana, I., Martinez Vazquez, J., Ribera, E., Ruiz, I., and Pellagra, M: Adenosine Deaminize in Body Fluids - A Useful Diagnostic Tool in Tuberculosis , Circulation 22, 141, 1989
11. 11-Diego A, etal use fullness of CEA Determination in BAL fluid A comparative study among patients with peripheral lung cancer, pneumonic and healthy individuals, service de Neurologic, Hospital university ariokeithc, Ganesh , Raghu, the clinical utility of BAL cellular analyzed in LID, Washington medical school.