

INTRODUCTION AND AIMS:

• Screening and targeted testing for tuberculosis is a key strategy for controlling and preventing infection.
• This study aimed to detect the prevalence of latent tuberculosis infection using Quantiferon TB Gold test (QFT) among dialysis patients.

METHODS:

• A prospective three-center study conducted in King Saud University, Riyadh, Saudi Arabia
• Adult HD and PD patients and above.
• Supported by King Abdulaziz City of Science and Technology with Reference No. ARP - 245-29.
• Demographic, health history and contact with TB, clinical data and laboratory information from each participant were gathered.
• Patients were screened for latent and active TB infection using both TST and QFT Test.
• Both QFT positive and negative patients were followed-up clinically and radiologically every 3 months for 2 years.

RESULTS

HD Group

• Data was completed for 181 patients
• Prevalence of latent TB using the QFT-GIT in 82 participants (45.3%)
• Positive TST was found in 30 (17.4%).
• QFT-GIT was significantly associated with TST ($p=0.043$, $\kappa=0.119$)
• Hemodialysis group risk factors cross tabulation with QFT and TST (table 2)
• Previous TB infection was significantly associated with positive QFT results ($p=0.009$)
• Splenomegaly ($rs=0.18$, $p=0.032$) were associated with positive QFT results,
• Lymph nodes and not splenomegaly remained statistically significant
• Positive TST was significantly associated with male gender even after controlling for confounding factors ($rs=0.22$, $p=0.007$)
• Abnormal chest examination was associated with positive TST ($rs=0.24$, $p=0.008$)

PD Group

• Data was completed for 62 participants
• Prevalence of latent TB using the QFT in 5 participants (8.1%)
• Positive TST was found in 6 (9.8%) of subjects
• There was no significant correlation and poor agreement between QFT and TST in this group ($p=0.415$, $\kappa=0.101$)
• Patients with splenomegaly on evaluation were significantly associated with positive QFT results ($rs=0.481$, $p=0.001$).
• Previous TB infection and contact with TB person was associated with positive TST results ($r=0.391$, $p=0.002$; $r=0.357$, $p=0.005$, respectively)
• Sensitivity and specificity testing for QFT and TST, Positive and Predictive Value are defined in Table 4.

TABLE 1. GROUP DEMOGRAPHICS AND TEST RESULTS

Variables	HD	PD
Total*	181	62
Age (SD)	55.6 (16.4)	50.5 (18.7)
Male Gender (%)	82 (45.3)	30 (48.4)
BMI (SD)	26.3 (6.5)	29 (6.9)
BCG Scar (%)	68 (42)	35 (56.5)
Previous TB (%)	14 (7.8)	1 (1.6)
TB Now (%)	3 (1.9)	9 (15.3)
Contact TB (%)	15 (8.4)	4 (6.8)
Smoker (%)Current	14 (8)	3 (5.1)
Quit	21 (11.9)	10 (16.9)
DM (%)	95 (53.1)	29 (47.5)
KT/V (SD)	1.5 (0.4)	N/A
Duration of dialysis, years (SD)	5.1 (5.4)	2.6 (2.5)
DM(%)	30 (17.6)	9 (15.8)
HTN(%)	44 (26)	14 (14.6)
DM&HTN(%)	33 (19.4)	14 (24.6)
LN(%)	1 (0.6)	0
Congenital(%)	10 (5.9)	2 (3.5)
NS(%)	6 (3.5)	5 (8.8)
Unknown(%)	46 (27.1)	13 (22.8)
QFT (%)Positive	82 (45.3)	5 (8.1)
TST (%)Positive	30 (17.4)	6 (9.8)
Abnormal CXR (%)	9 (5.9)	7 (11.5)

DM – Diabetes Mellitus, HTN – Hypertension, LN – Lupus Nephritis, NS – Nephrotic Syndrome, CXR – chest x-ray

TABLE 2. HEMODIALYSIS GROUP RISK FACTORS CROSS TABULATION WITH TESTS.

N (%)		QFT			TST		
		+ve	-ve	p-value	+ve	-ve	p-value
Previous TB	Yes	11 (78.6)	3 (21.4)	0.009*	6 (42.9)	8 (57.1)	0.019*
	No	70 (42.2)	96 (57.8)		24 (15.2)	134 (84.8)	
BCG Scar	Present	28 (41.2)	40 (58.8)	0.495	11 (16.2)	57 (83.8)	0.386
	Absent	40 (42.6)	54 (57.4)		17 (19.3)	71 (90.7)	
Contact TB	Yes	5 (33.3)	10 (66.7)	0.252	2 (13.3)	13 (86.7)	0.49
	No	75 (46)	88 (54)		28 (17.9)	128 (82.1)	
DM	Yes	42 (44.2)	53 (55.8)	0.441	13 (14.1)	79 (85.9)	0.144
	No	39 (46.4)	45 (53.6)		17 (21.5)	62 (78.5)	
HCV	Yes	17 (48.6)	18 (51.4)	0.368	12 (34.3)	23 (65.7)	0.006*
	No	62 (43.7)	80 (56.3)		18 (13.3)	117 (86.7)	
IHD	Yes	20 (50)	20 (50)	0.291	12 (31.6)	26 (68.4)	0.012*
	No	60 (43.5)	78 (56.5)		18 (13.5)	115 (86.5)	
Steroids	Yes	8 (36.4)	14 (63.6)	0.257	6 (27.3)	16 (72.7)	0.151
	No	71 (46.4)	82 (53.6)		23 (15.8)	123 (84.2)	

HCV – Hepatitis-C Virus, IHD – Ischemic Heart Disease

TABLE 3. PERITONEAL DIALYSIS GROUP RISK FACTORS CROSS TABULATION WITH TESTS.

N (%)		QFT			TST		
		+ve	-ve	p-value	+ve	-ve	p-value
Previous TB	Yes	0	1 (100)	N/A	1 (100)	0	N/A
	No	5 (8.2)	56 (91.8)		5 (8.3)	55 (91.7)	
BCG Scar	Present	1 (2.9)	34 (97.1)	0.107	2 (5.7)	33 (94.3)	0.206
	Absent	4 (14.8)	23 (85.2)		4 (15.4)	22 (86.6)	
Contact TB	Yes	0	4 (100)	N/A	2 (50)	2 (50)	0.049*
	No	5 (9.1)	50 (90.9)		4 (7.4)	50 (92.6)	
DM	Yes	2 (6.9)	27 (93.1)	0.548	3 (10.3)	26 (89.7)	0.632
	No	3 (9.4)	29 (90.6)		3 (9.7)	28 (90.3)	
HCV	Yes	0	3 (100)	N/A	0	3 (100)	N/A
	No	5 (8.3)	55 (91.7)		6 (10.7)	50 (89.3)	
IHD	Yes	0	11 (100)	N/A	1 (9.1)	10 (90.9)	0.698
	No	5 (10)	45 (90)		5 (10.2)	44 (89.8)	
Steroids	Yes	1 (12.5)	7 (87.5)	0.582	0	8 (100)	N/A
	No	4 (9.1)	90 (90.9)		6 (13.6)	38 (86.4)	

TABLE 4. SENSITIVITY, SPECIFICITY, TB PREVALENCE, PPV, NPV FOR QFT AND TST AMONG GROUPS.

Group		QFT Test	TST Test
HD	Sensitivity (95% CI)	91.67% (80 – 97.6%)	63.16% (46 – 78.2%)
	Specificity (95% CI)	71.43% (63 – 78.9%)	95.52% (90.5 – 98%)
	PPV (95% CI)	19.5 (14 – 25%)	51.5 (44 – 59%)
	NPV (95% CI)	91.1 (87 – 95%)	91.1 (87 – 95%)
PD	Sensitivity (95% CI)	7.69% (1.3 – 36.1%)	35.71% (13 – 65%)
	Specificity (95% CI)	91.84% (80 – 97.7%)	97.87% (89 – 99.6%)
	PPV (95% CI)	6.6 (0 – 13%)	55.8 (43 – 68%)
	NPV (95% CI)	92.3 (87 – 99.3%)	93.3 (87 – 99.6%)

Prevalence – 7%¹ Reference: Waness, 2012 [27]- PPV – positive predictive value, NPV – negative predictive value

CONCLUSION

• Due to the high variability of QFT sensitivity, it should not be used as the sole determinant of tuberculosis status.
• We recommend to use Quantiferon TB Gold in-tube test for its negative predictive value in diseased patients in conjunction with or post-positive TST and to use either TST or QFT as they have the same significance in diagnosing latent TB.

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