Evaluation of Function of Angiopoietins and ANIOPOIETIN Likes in Post-Transplantation Diabetes Mellitus (PTDM) In Kuwaiti Kidney Transplanted Patients

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Background

- Post Transplantation Diabetes Miletus (PTDM) is a chronic metabolic disease developed in some of our kidney transplant patients. PTDM is a chronic, inflammatory disease with direct impact of patients' immune system. Angiopoietin and Angiopoietin like are intrinsic mediators induced by immune cells.

Objectives

- To determine the relationship between circulating Angiopoietin-1 and 2 (ANG-1, 2) and Angiopoietin like (ANGPTL 3-8) in kidney transplant patients who develop diabetes (PTDM) vs. patients who do not develop diabetes(CONTROL) after kidney transplantation.

Methods

- In this cross-sectional study, all patients were enrolled from Dasman Diabetes Institute Diabetes Education Department and outpatient clinics of the Hamad Al Essa Organ Transplant Centre of Kuwait between May 2015 and December 2016. The present study included 155 PTDM and 154 controls, age- and sex-matched. We collected 3 ml of venous blood from each subject. Enzyme-linked immunosorbent assay (ELISA) determined plasma ANG 1 ,2 and ANGPTL 3-8. We determined the correlation between plasma ANG 1 and 2 and ANGPTL3-8 levels in our PTDM and Control group.

Results

- In our cohorts, most of patients (56%) were Kuwaiti. Moreover, the two groups were comparable regarding their original kidney disease, dialysis type, donor type and the type of both induction and maintenance immunosuppression (P > 0.05). Also, pre-transplant co-morbidities were comparable in both groups, including hypertension, history of exposure to tuberculosis bacilli, ischemic heart disease, bone disease, anaemia and hyperlipidaemia (P > 0.05).

- We found significantly higher plasma ANG-1, ANGPTNL 6, 7, 8 levels in PTDM group compared to control group (P < 0.001). However, we found no statistical association between our study groups concerning plasma ANG 2, ANGPTNL 3, 4 (p>0.05).

Table 1:Shows some characteristics of studied subjects

	PTDM		Control (non-diabetic)		P value
	N	%	N	%	
Age Groups /Years					
<40	28	18.1	98	63.2	
40-60	80	52.0	45	29.1	
>60	46	29.9	12	7.7	
					<0.001
Donor mean age/years	34.4±9.1		34.7±8.8		0.77
Nationality					
Kuwaiti	76	49.4	93	60.0	
Non-Kuwaiti	78	50.6	62	40.0	
					0.06
Patient sex(male/female)	107/47		112/43		0.59

Table 2: shows the mean of the studied ANGPT and ANGPL in both groups

NC/NP		N	Mean	Std. Deviation	Std. Error Mean	p-value	
ANGPTL-6	Control	155	69974.8703	14954.00510	1201.13459	0.001	
	PTDM	153	75135.3270	16012.21611	1294.51095		
BDNF	Control	129	6143.5674	2246.10530	197.75855	<0.0001	
	PTDM	146	4864.4518	2260.32448	187.06579		
ANGPT1	Control	155	43781.5703	13239.94488	1063.45796	<0.0001	
	PTDM	153	32628.9786	15738.05572	1272.34639		
ANGPTL-4	Control	155	403451.6083	91365.99282	7338.69314	0.469	
	PTDM	152	407177.6520	86546.64776	7019.86010		
ANGPT2	Control	155	20133.7939	5795.38832	465.49679	0.318	
	PTDM	153	20224.8213	4653.48515	376.21198		
ANGPTL-3	Control	155	92205.3612	21586.09279	1733.83670	0.741	
	PTDM	151	90780.6664	20307.24272	1652.57998		
ANGPTL7	Control	155	10660.31964	4731.498944	380.043141	<0.0001	
	PTDM	153	7897.43770	5035.225150	407.073826		
ANGPTL8	Control	155	4038.26901	3379.915865	271.481375	0.04	
	PTDM	153	4343.11137	2922.722335	236.288096		

Conclusion

- Plasma ANG 1, ANGPTNL6, 7, 8 levels may correlate with disease severity, chronicity in transplant patients who develop diabetes post Kidney transplantation and serve as a potential biomarker of the disease severity.

- **Key Word:** Angiopoietin; Angiopoietin Like, Kidney Transplantation, PTDM, ELISA