Thyroid hormone levels and mortality after heart transplantation

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Background and Goal of Study:

Thyroid hormone levels decreases after acute, serious systemic stress. Triiodothyronine (T3) and tetra iodothyronine (T4) have physiological effects on the cardiovascular system. T3 and T4 decrease peripheral vascular resistance and have a positive chronotropic and inotropic effect. The purpose of our study was to examine the relationship among T3, T4 levels and mortality after orthotopic heart transplantation.

Multivariate Cox regressional analysis for 30-days mortality adjusted for UNOS score, postoperative MCS and extended MV (>72h)

	OR	95% CI		p
postoperative low T3 and T4	18.26	1.22	272.22	0.035

Multivariate Cox regressional analysis for total mortality adjusted for UNOS score, postoperative MCS and extended MV (>72h)

postoperative low T3 and T4	21.86	2.42	197.74	0.006
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Methods:

Our retrospective study was approved by the IRB and contained the data of 127 patients undergoing orthotopic heart transplantation. Beside postoperative thyroid function (T3, T4, TSH levels), vasopressor-inotropic needs, demographic parameters, mechanical cardiac support and UNOS (United Network for Organ Sharing) score were investigated. Eighty five patients had postoperative thyroid levels. We used Mantel-Cox log-rank test and multivariable Cox regression for further investigation.

Thyroid hormones serum concentration in serious systemic stress

Results and Conclusions:

12 of the 85 (14.1%) patients died, the mean survival time was 466 days after transplantation. 30-days mortality was 7.1%. 8 (9.4%). We have found independent relationship among both lower T3 and T4 and 30-days and total mortality (p=0.035 and p=0.006 respectively).

Based on the above results, thyroid function should be monitored after heart transplantation. Early thyroid hormone replacement therapy might be discussed.

Klein I: Thyroid hormone and the cardiovascular system. The American journal of medicine. 88:631-637, 1990.
Van den Berghe G: Non-thyroidal illness in the ICU: a syndrome with different faces. Thyroid : official journal of the American Thyroid Association. 24:1456-1465, 2014.

Perioperative parameters:

normal ranges:T3 – 2.89-4.88 pmol/L; T4 – 9.00-23.20 pmol/L	All patinets = 85			Survivors = 73			Non- survivors = 12			P
	Med.	n	%	Med.	n	%	Med.	n	%	
		IQR 25	IQR 75		IQR 25	IQR 75		IQR 25	IQR 75	
Recipients:										
female sex		19.00	22.40		14.00	19.20		5.00	41.70	0.083
age (years)	54.00	45.00	59.00	54.00	44.00	58.50	52.50	50.25	60.75	0.380
hypothyroidism		8.00	9.40		8.00	9.40		0.00	0.00	0.594
hyperthyroidism		6.00	7.10		5.00	6.80		1.00	8.30	1.000
UNOS score	3.00	2.00	5.00	3.00	2.00	5.00	4.50	3.25	6.00	0.047
postoperative MCS		14.00	16.50		7.00	9.60		7.00	58.30	0.001
extended MV (>72 h)		23.00	27.10		19.00	26.00		4.00	33.30	0.737
postoperative low T3		48.00	58.50		38.00	54.30		10.00	83.30	0.059
postoperative low T4		5.00	6.20		3.00	4.30		2.00	18.20	0.075
postoperative low T3 and T4		4.00	5.00		2.00	2.90		2.00	18.20	0.089