

超滤对体外循环下心脏瓣膜手术患者血清乳酸的影响

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【摘要】：目的：分析常规超滤对体外循环（CPB）下心脏瓣膜手术患者血清乳酸水平差异比较。方法：本研究于 2020 年 6 月正式启动，截止时间是 2021 年 6 月。选用此时间段到笔者医院接受救治的心脏瓣膜手术患者 42 例为研究对象，所有患者均接受常规超滤。对比观察 42 例患者各时段血清乳酸水平比较，并对患者围术期血液指标以及术后恢复情况进行观察。结果：与术前相比，患者术中 30min、术中 80min 以及术中 120min 血清乳酸水平比较，均低于术前（ $P<0.05$ ）；观察术前（T0）、升主动脉阻断后 10min（T1）、升主动脉阻断后 1h（T2）、升主动脉阻断后 2h（T3）两组血浆黏度、红细胞比容、血氧分压（PO₂）、血氧饱和度（SO₂）指标比较发现，观察不同时间节点发现，与 T0 时间节点相比，T1、T2、T3 两组血浆黏度有明显降低（ $P<0.05$ ），术后 24h（T4）、术后 36h（T5）与 T0 相比无统计学差异（ $P>0.05$ ）；与 T0 时间节点相比，42 例患者红细胞比容在 T1、T2、T3、T4、T5 时均有统计学差异（ $P<0.05$ ），T2、T3、T4、T5 时红细胞比容升高（ $P<0.05$ ）；观察 42 例患者术后恢复情况发现，术后输血量、术后拔管时间以及 ICU 时间，分别为（ 2.43 ± 1.23 ） μ 、（ 10.26 ± 2.33 ）d、（ 42.39 ± 9.24 ）d；围术期，42 例患者 PO₂ 指标、SO₂ 指标未见较大波动（ $P>0.05$ ）。结论：在 CPB 下心脏瓣膜术中应用常规超滤，不会对患者血液流变学产生不利影响，利于缩短患者术后 ICU 停留时间，有助于促进患者康复，临床可进一步推广运用。

【关键词】：体外循环；心脏瓣膜术；常规超滤；血清乳酸

Effect of Ultrafiltration on Serum Lactic Acid in Patients Undergoing Cardiac Valve Surgery under Cardiopulmonary Bypass

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Abstract: Objective: To analyze the difference of serum lactic acid level in patients undergoing cardiac valve surgery under cardiopulmonary bypass (CPB) by conventional ultrafiltration. Methods: The study was officially launched in June 2020, and the deadline was June 2021. 42 patients with cardiac valve surgery who were treated in the author's hospital during this period were selected as the study objects, and all patients received conventional ultrafiltration. The levels of serum lactic acid in 42 patients at different periods were compared, and the perioperative blood indexes and postoperative recovery were observed. Results: Compared with that before operation, the serum lactic acid levels of patients at 30 min, 80 min and 120 min during operation were lower than those before operation ($P<0.05$); The indexes of plasma viscosity, specific volume of red blood cells, partial pressure of blood oxygen (PO₂), and saturation of blood oxygen (SO₂) were observed before operation (T0), 10 minutes after ascending aorta occlusion (T1), 1 hour after ascending aorta occlusion (T2), and 2 hours after ascending aorta occlusion (T3). It was found that the plasma viscosity in T1, T2, and T3 groups was significantly lower than that in T0 time nodes ($P<0.05$), and 24 hours after operation (T4) There was no significant difference between T5 and T0 at 36h after operation ($P>0.05$); Compared with T0 time node, the hematocrit of 42 patients at T1, T2, T3, T4, T5 were statistically different ($P<0.05$), and the hematocrit increased at T2, T3, T4, T5 ($P<0.05$); The postoperative recovery of 42 patients was observed. The postoperative blood transfusion volume, extubation time and ICU time were (2.43 ± 1.23) μ 10.26 $\pm$ 2.33 d 42.39 $\pm$ 9.24 d; During the perioperative period, the indexes of PO₂ and SO₂ in 42 patients did not fluctuate significantly ($P>0.05$).

Conclusion: The application of conventional ultrafiltration in cardiac valve surgery under CPB will not have adverse effects on the hemorheology of patients. It is beneficial to shorten the stay time of patients in ICU after surgery and promote the rehabilitation of patients. It can be further popularized in clinical practice.

Keywords: Extracorporeal Circulation; Cardiac valve surgery; Conventional ultrafiltration; Serum lactic acid

				t	n	%					χ^2	P<0.05
[1-2]				Cardio-pulmonary Bypass				2 结果				
CPB				2.1				42				
				30min				80min				
				0.91±0.33				mmol/L				
				mmol/L				2.11±0.35				
				mmol/L				3.28±1.05				
				mmol/L				mmol/L				
[3-4]				42				30min				
				80min				120min				
				t=2.413				p=0.018				
				t=16.167				p=0.000				
				t=13.955				p=0.000				
				P				0.05				
CPB				2.2				42				
				T0				T1				
				T2				T3				
				T4				T5				
				1.18±0.02				mPa/s				
				1.25±0.12				mPa/s				
				1.13±0.06				mPa/s				
				1.12±0.06				mPa/s				
				1.21±0.12				mPa/s				
				1.21±0.07				mPa/s				
				T0				T1				
				t=3.729				p=0.000				
				T2				t=5.123				
				p=0.000				T3				
				t=6.148				p=0.000				
				T4				t=1.598				
				p=1.114				T5				
				t=1.285				p=0.203				
				T0				T1				
				T2				T3				
				P				0.05				
				24h				P				
				T4				36h				
				T5				T0				
				0.05								
				T0				T1				
				T2				T3				
				T4				T5				
				0.42±0.01				0.21±0.04				
				0.23±0.02				0.27±0.02				
				0.33±0.02				0.40±0.02				
				T0				T1				
				t=33.008				T2				
				t=55.067				p=0.000				
				T3				t=43.474				
				p=0.000				T4				
				t=26.084				p=0.000				
				T5				t=5.797				
				p=0.000								
				T0				42				
				T1				T2				
				T3				T4				
				T5				P				
				0.05				T2				
				T0				T1				
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T0 T1 t=1.654 p=0.102 T2 t=1.796
p=0.076 T3 t=1.711 p=0.091 T4 t=1.907 p=0.060
T5 t=1.610 p=0.111

ICU

42 PO₂ SO₂

P 0.05

CPB

2.3

42

ICU

ICU

2.43±1.23 μ

10.26±2.33 d 42.39±9.24 d

3 讨论

CPB

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CPB

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[3] , , , .

T0 T1 T2
T3 P 0.05

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42

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CPB

CPB