주최·주관 대한심장혈관흉부외과학회

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제56차 추계학술대회

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Optimal Timing for Initiation of Veno-Venous Extracorporeal Membrane Oxygenation in Neonatal and Pediatric Respiratory Failure

공지사항

- 소속기관이나 저자명이 드러나지 않도록 해주세요.
- 제목 슬라이드 포함 최대 6장, Font size 20 이상
- PPT 파일 작성 후 PDF로 전환해서 접수(필수)

Purpose

- Veno-Venous Extracorporeal Membrane Oxygenation (VV-ECMO) is commonly used for severe respiratory failure with preserved cardiac function, and potentially preventing ventilator-induced lung injury.
- Guidelines for VV-ECMO support in pediatric RDS patients are not well-established.
- We aimed to clarify optimal timing to initiate the VV-ECMO in pediatric RDS patients based on our clinical experience.
- Severe pediatric respiratory distress syndrome (RDS) is recognized for its severe hypoxemia and high mortality rate, often indicated by an oxygen index (OI) exceeding 16.

Methods

- December 2016 and February 2024
- 32 RDS patients requiring VV-ECMO support : retrospectively reviewed
- Two groups: mortality cases vs. survival cases

Primary outcome

- OI value at the time VV-ECMO was initiated
- OI value before 8 hours from VV-ECMO initiation.

Various other clinical parameters

- fraction of inspired oxygen (FiO2); mean airway pressure (MAP); partial pressure arterial oxygen (PaO2) level; PaO2/FiO2 (PF) ratio; serum lactate level; ventilator use with nitric oxide (NO); anticoagulation-associated complications.

Results

Variable		Total (32)	Non-survivor (19)	Survivor (13)	p-value
8 hrs before ECMO initiation	FiO2 (%)	70 (60-84)	75 (70-95)	60 (50-62)	0.026*
	MAP (cmH2O)	18.7 (13.0-22.0)	21.1 (15.5-22.6)	17.0 (13.0-19.0)	0.040*
	PaO2 (mmHg)	54 (41-65)	45 (35-63)	59 (47-66)	0.103
	Sat (%)	84 (65-91)	76 (61-89)	87 (79-91)	0.179
	OI	24.6 (15.0-41.8)	31.5 (19.5-45.8)	15.6 (12.9-24.0)	0.008*
	PF ratio	38.1 (30.0-46.7)	39.0 (28.5-47.0)	37.2 (32.5-43.8)	0.985
At ECMO initiation	FiO2(%)	95.5 (62-100)	96 (70-100)	62 (60-100)	0.201
	MAP(cmH2O)	19.1 (16.0-22.6)	21.0 (18.0-23.5)	17.8 (14.0-20.2)	0.052
	PaO2(mmHg)	56 (40-66)	55 (34-61)	61 (42-78)	0.111
	Sat%	85 (66-95)	84 (54-91)	88 (70-95)	0.257
	OI	33.4 (18.0-49.3)	39.0 (26.7-62.7)	19.9 (10.8-43.9)	0.030*
	PF ratio	41.0 (33.0-47.8)	41.0 (31.4-48.6)	41.0 (36.6-46.5)	0.818
	NO (ppm)	24.7±22.9	32.1±21.8	11.1±20.6	0.021*
	Lactate	0.85 (0.40-1.83)	1.05 (0.63-1.85)	0.65 (0.38-1.83)	0.418
MV duration (day) before ECMO		2 (1.0-16.5)	2 (1.0-17.0)	2 (1.0-14.0)	0.954
VV-ECMO duration (day)		9.5 (5.0-32.0)	8 (5.5-28.5)	11 (4.0-41.0)	0.908
Circuit Change (n)		0.8±1.2	0.5±1.0	0.5±1.3	0.164

Results

Anticoagulation-associated complications

- ECMO intervention site bleeding (1/32, 3.13%)
- Cerebral hemorrhage (3/32, 9.38%)
- Cerebral infarction (0/32, 0%)

- ECMO catheter withdrawal (1/32, 3.13%)

Survival rate : 13/32 (40.6%)

	OI>16	OI>15
n	22	23
survival rate	0.27	0.30

	non-survivor	survivor	total
thrombus (+)	7	6	13
thrombus (-)	12	7	19
total	19	13	32

→ Thrombus in circuit during VV-ECMO support has no relationship between survivor and deceased group (p=0.598)

Conclusion

- In RDS patients, regular monitoring of the OI is essential to determine the appropriate timing for initiating ECMO support as a therapeutic option.

- With little risks in supporting VV-ECMO, Therefore, we aim to initiate VV-ECMO support slightly earlier when OI values are low.