Letter to the Editor

Submitted: 22-06-2022
Accepted: 25-06-2022

DOI: https://doi.org/10.47338/jns.v11.1098

Large defect size is associated with 30-day mortality following surgical repair of congenital diaphragmatic hernia

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Dear Sir

Congenital diaphragmatic hernia (CDH) is one of the most challenging neonatal conditions occurring in 3 in 10000 live births. [1] Despite considerable recent advances in perinatal resuscitation and neonatal care, CDH remains an important cause of mortality with rates ranging from 25% to 50%. [2-5] The leading causes of death in these patients are persistent pulmonary hypertension and severe lung hypoplasia. [6] Many researchers have studied the association between prognostic factors and mortality following surgical repair of CDH. However, these prognostic factors did not find widespread use due to conflicting results. Moreover, most studies regarding CDH outcomes are from developed countries. The management of these patients in developing countries is more challenging. In Tunisia, as in many developing countries, extracorporeal membrane oxygenation and synthetic patches are not available. The aim of this study was to assess risk factors for 30-day mortality following surgical repair of congenital diaphragmatic hernia in a single center in Tunisia.

Table 1: Post-natal factors associated with 30-day mortality in patients undergoing surgical repair for congenital diaphragmatic hernia

		Non-survivor Group (N=25)		Survivor Group (N=29)		p Value*	Odds ratio*
		N	%	N	%		
Male gender	Yes	18	72	20	69	0.808	-
	No	7	28	9	31		
Prenatal diagnosis	Yes	5	20	7	24.1	0.715	-
	No	20	80	22	75.9		
Antenatal Dexamethasone	Yes	3	12	3	10.3	0.847	-
	No	22	88	26	89.7		
Birth weight <2800g	Yes	15	60	6	20.7	**0.003**	**5.750**
	No	10	40	23	79.3		
Vaginal delivery	Yes	12	48	18	62.1	0.300	-
	No	13	52	11	37.9		
Inborn	Yes	15	60	13	44.8	0.266	-
	No	10	40	16	55.2		
5-min Apgar score≤ 6	Yes	14	56	2	6.9	**<0.001**	**17.182**
	No	11	44	27	93.1		
Right Side	Yes	6	24	9	31	0.565	-
	No	19	76	20	69		
Large defect size (type 'C' and 'D' lesions)**	Yes	23	92	10	34.5	**<0.001**	**21.850**
	No	2	8	19	65.5		
Liver herniation	Yes	17	68	9	31	**0.007**	**4.722**
	No	8	32	20	69		

* p-Value and Odds ratio have been bolded if p < 0.05. ** According to Lally classification [7]

We conducted a retrospective data collection through a review of the patients' medical records. All neonates with surgical management of CDH between January 1, 2010, and December 31, 2021, were included. Diaphragmatic defects were classified according to size into four groups (A, B, C, D) using the Lally

grading system. [7] The Ethical Committee of the Hedi Chaker University Hospital, Sfax, Tunisia, approved the study (HCH/022/0228).

Our patients were divided into two groups: the survivor group included 29 (53.7%) neonates, and the decreased group 25 (46.3%) neonates. A total of 54 of 72 patients had defect classification: 3 A, 18 B, 24 C, and 9 D. Thirty-day mortality rate was 0%, 11.1%, 66.7%, and 77.8% in groups A, B, C, and D, respectively. In the multivariate analysis, a reverse stepwise logistic regression analysis of the data comparing the non-survivor and the survivor groups demonstrated that children with large defect sizes had over twenty-one times greater risk of dying than those with type "A" and "B" diaphragmatic defects. The other predictive factors of 30-day mortality after surgical management of CDH were: birth weight< 2800g (P =0.003, Odds ratio [OR] =5.750, 5-min Apgar score≤ 6 (P <0.001, OR =17.182), and liver herniation (P <0.001, OR =4.722) (Table 1).

To the best of our knowledge, this is the first study in the Middle East and North Africa to assess short-term outcomes in neonates with CDH. Our study showed that large defect size, birth weight< 2800g, 5-min Apgar score≤ 6, and liver herniation were predictive for 30-day mortality in these patients. Further prospective multicenter cohort studies are needed to validate the identified predictive factors.

Acknowledgements: Nil

Conflict of Interest: None declared

Source of Support: Nil

Consent to Publication: No clinical figure is being used in this manuscript.

Author Contributions: Author(s) declared to fulfil authorship criteria as devised by ICMJE and approved the final version.

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