IS THE SPONTANEOUS BREATHING TEST A RELIABLE PREDICTOR OF VENTILATED NEONATAL WEANING? A PILOT PROSPECTIVE OBSERVATIONAL STUDY

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ABSTRACT:

Background: *It is still difficult to determine the best time to wean ventilated newborns in order to reduce the duration spent on the ventilator and prevent extubation failure. Particularly in low resource newborn intensive care units (NICU) with limited access to lung ultrasonography or more advanced technology, the spontaneous breathing test (SBT) is recommended to predict successful weaning.*

Aim of the study: *Our study aims to validate SBT as a reliable objective test for mechanically ventilated neonates' extubation success.*

Patients and Methods: *Pilot prospective observational study done on 50 ventilated neonates 27-42 weeks' gestation. 4 died while still intubated, 4 were accidentally extubated before SBT and 3 had pneumothorax and were excluded. The attending physician made the decision to wean the patient based on the patient's clinical condition, hemodynamic status, and venous blood gases. Prior to their extubation, the 39 patients had SBT, and the results were documented. According to the success or failure of the weaning trial, they were furtherly split into two groups.*

Results: *We studied the 39 neonates who were split into success and failure groups according to their weaning trial. SBT was passed in 84.2% of the success group compared to 36.4% of the failure group. SBT has an accuracy of 76.7% with sensitivity of 63.6% and specificity of 84.2% in predicting successful extubation.*

Conclusion: *SBT is a reliable test for determining if ventilated newborns are ready to wean. It can be included as the last stage of the NICU protocol for ventilation weaning.*

Key words: *ventilation, extubation, spontaneous breathing test, neonates*

INTRODUCTION:

As there are still no reliable standardised tests or criteria to identify patients' preparedness for extubation, determining the ideal timing for weaning infants from mechanical ventilation (MV) remains difficult [(1)]. Early weaning can raise the likelihood of respiratory failure later on, which would require reintubation[(2)]. Neonatalogists should begin to plan weaning as soon as invasive ventilation begins in order to reduce the risks of bronchopulmonary dysplasia, neurodevelopmental delay, and increased mortality that are linked with prolonged ventilation in neonates, especially preterms[(3)].

Weaning has historically been determined by clinical judgement based on a variety of factors, such as ventilator settings

and blood gas values. Extubation strategies couldn't be standardized due to numerous variables studied such as lung function parameters, respiratory mechanics or gestational age[4]. Birth weight, Apgar scores, the fraction of inspired oxygen (FiO_2) prior to extubation, cardiorespiratory variability, lung sizes, respiratory muscle strength, inspiratory load, spontaneous minute ventilation, tidal volumes, and lung ultrasound were among the variables examined. Lung ultrasound and its findings are currently being studied as a subjective tool for prediction of weaning readiness[5].

Due to the restricted number of NICU beds in low- and middle-income countries, it is crucial to reduce unnecessary ventilation or hospitalisation by one day while also avoiding problems. Furthermore, not all NICUs have access to cutting-edge technologies like lung ultrasonography, which makes it extremely harder to optimise the weaning process.

AIM OF THE STUDY:

Our study aims to validate SBT as a reliable objective test for mechanically ventilated neonates' extubation success.

PATIENTS AND METHODS:

In this prospective observational study, infants who were mechanically ventilated in the NICU in the children's hospital, Ain Shams University Pediatric Hospital in the year 2018 were included.

Patients:

We recruited 50 invasively ventilated neonates for more than 48 hours, whose gestational ages from 27 to 42 weeks. We excluded neonates with significant congenital anomalies including any cardiac, abdominal or respiratory anomalies and those who had tension pneumothorax. 11 of the patients were excluded: 4 of them died while still intubated, 4 of the patients were accidentally extubated before performing the SBT and 3 had pneumothorax. So, we studied the 39 ventilated neonates. The study was approved by the ethical committee and an informed consent was obtained from each infant's legal guardian before enrollment in the study.

They were divided into two groups according on whether the weaning trial was successful or unsuccessful: the success "S" group, which included 25 participants, and the failure "F" group, which included 14 participants.

Methods:

Throughout their stay in the NICU, all of the study patients underwent thorough clinical examinations and medical histories. Monitoring of respiratory conditions, including the administration of surfactant (Curosurf®, 200 mg/kg if given)[6]. The total length of the NICU stay was also noted.

The following ventilation parameters, together with the length of the ventilation, were noted: the percentage of inspired oxygen (FiO_2), the peak inspiratory pressure (PIP), the positive end expiratory pressure (PEEP), the mean airway pressure (MAP), the respiratory rate (RR), and the inspiratory time (IT). Additionally, Oxygen saturation detected by pulse oximetry was documented.

Mortality and morbidity were documented: including Bronchopulmonary dysplasia (defined as need of supplemental oxygen ≥28 days[7], ventilator-associated pneumonia, or necrotizing enterocolitis.

Laboratory tests: CBC, CRP, venous blood gases, blood culture and bleeding profile are all types of blood tests. Moreover, Chest x-ray and echocardiography which was done to detect any structural cardiac anomalies, patency, significance of ductus arteriosus and persistent pulmonary hypertension. (Echocardiography was done by LOGIQ 400

pro-series (General Electric) or Samsung ultrasound HM70A with S-Vue transducer).

The hemodynamically significant PDA was diagnosed echocardiographically by Trans-ductal diameter (mm) > 1.4, Left pulmonary artery diastolic flow mean velocity ≥0.42 cm/sec and peak velocity > 0.2 cm/sec, Retrograde diastolic flow (%) in descending aorta ≥30% and LVO/SVC flow ratio ≥ 4 (LVO = left ventricular output, SVC = superior vena cava)[8].

Extubation decision was taken independently by the attending physician when patients were on minimal ventilator settings and had accepted venous blood gases.

Table 1: Ventilatory settings at which neonates should be extubated[9]

Conventional Ventilation (PTV, SIMV, PSV) • SIMV: PIP ≤16 cm H_2O, PEEP ≤6 cm H_2O, rate ≤20, FiO_2 ≤0.30 • PTV/PSV, BW<1000 g: MAP ≤7 cm H_2O and FiO_2 ≤0.30 • PTV/PSV, BW >1000 g: MAP ≤8 cm H_2O and FiO_2 ≤0.30
Volume Ventilation • Tidal volume ≤4.0 mL/kg (5 mL/kg if <700 gm or >2 weeks of age) and FiO_2 ≤0.30

PTV: Patient Triggered Ventilation, SIMV: Synchronized Intermittent Mandatory Ventilation, PSV: Pressure Support Ventilation, PIP: Positive Inspiratory Pressure, PEEP: Positive End Expiratory Pressure, FiO_2: Fraction of Inspired Oxygen, MAP: Mean Airway Pressure, BW: Birth weight

Prior to extubation:

Feeds were withheld 4 to 6 hours, or the stomach was emptied.

SBT was done just before extubation, while the infant is still intubated by changing the ventilation mode to "Continuous Positive Airway Pressure" (CPAP) for up to 5 minutes without pressure support. SBT results were either failed or successful. If the patient experienced any of the following, SBT was regarded to have failed: significant bradycardia (heart rate <100 bpm for more than 10 sec or severe enough to require intervention) or oxygen desaturation (<85% for >15 sec). Infant was put back on the same ventilator settings as before the SBT if the patient failed it[10].

Failure of extubation was defined as the requirement for reintubation up to 48 hours following extubation[11].

Post extubation management:

According to the patient's clinical condition and our NICU protocol, non-invasive intermittent positive pressure ventilation (NIPPV) or nasal CPAP with a minimum pressure of 5 cmH_2O may be used. Patients who had more labored breathing were given NIPPV. Nebulization with adrenaline at a dose of 0.5 mL/kg diluted in normal saline[12].

Criteria for reintubation:

Infant receiving maximal respiratory support CPAP 8 cmH_2O (or NIPPV with PEEP 8 cmH_2O). And any one of the following:

(1) FiO_2 of 0.21 or higher above the pre-extubation baseline value was needed to keep the peripheral oxygen saturation between 88% and 92%;

(2) More than one apnoeic episode that necessitates intermittent positive pressure breathing in a day, or six or more apnoeic episodes that require stimulation in a row.; or

(3) An immediate requirement for reintubation, as decided by the treating physician[3].

Statistical Analysis:

Data were collected, revised, coded and entered to the Statistical Package for Social Science (IBM SPSS) version 23. The quantitative data with a parametric distribution were expressed as mean,

standard deviations and ranges as opposed to median with inter-quartile range (IQR) if non parametric. Qualitative variables were presented as number and percentages and were compared using *Chi-square test.* Using an *independent t-test*, two independent groups with quantitative data and parametric distribution were compared as opposed to *Mann-Whitney test* was used in data with non-parametric distribution**.**

The confidence interval was set to 95% and the margin of error accepted was set to 5%. So, the p-value was considered significant if < 0.05- otherwise it is non-specific

RESULTS:

Our study included 39 ventilated neonates fulfilling the inclusion and exclusion criteria. They were split into two groups, "S" group and "F" group, depending on whether the weaning trial was successful or not. Table (2) displays the characteristics of both groups and table (3) shows the results of both groups' lab tests. The patients' comorbidities are listed in table (4), along with their results (5). As can be seen in tables (6) and (7), the ventilator settings and mode were compared in both groups before and after extubation. Prior to extubation, SBT was performed on each patient, and when the results from the two groups were compared, a highly significant difference was seen. In light of this, we investigated the SBT accuracy and determined its sensitivity and specificity in table (8).

Table (2): Comparison of the groups' demographic information, diagnoses, and ages on NICU admission.

		S group	F group	P-value
		No. = 25	No. = 14	
Gender	Male	15 (60.0%)	7 (50.0%)	0.546
	Female	10 (40.0%)	7 (50.0%)	
Gestational age (weeks)	Mean ± SD	34.44 ± 3.56	32.00 ± 4.26	0.064
	Range	29 – 41	27 – 41	
Maturity	Preterm	14 (56%)	12 (85.7%)	0.059
	Full-term	11 (44.0%)	2 (14.3%)	
Birth weight (Kg)	Mean ± SD	2.08 ± 0.77	1.69 ± 0.63	0.108
	Range	1.15 – 3.6	1 – 3	
Mode of delivery	Caesarean section	7 (28.0%)	4 (28.6%)	0.970
	Vaginal delivery	18 (72.0%)	10 (71.4%)	
Diagnosis	RDS	11 (44.0%)	9 (64.3%)	0.404
	Congenital pn	9 (36.0%)	1 (7.1%)	
	MAS	1 (4.0%)	1 (7.1%)	
	Pulmonary hypertension	1 (4.0%)	1 (7.1%)	
	Sepsis	3 (12.0%)	2 (14.3%)	
Chronological age on admission(days)	Median (IQR)	1 (1 – 3)	1 (1 – 1)	0.226
	Range	1 – 21	1 – 3	

RDS: respiratory distress syndrome, MAS: meconium aspiration syndrome, Congenital pn: congenital pneumonia.

As demonstrated in the previous table both groups were comparable in terms of gestational age, gender, birthweight, mode of delivery as well as diagnosis and chronological age on admission.

Table 3: Comparison of the S" and "F" groups' laboratory findings on initiation of ventilation

		S group	F group	p-value
		n = 25	n= 14	
CRP	Negative	10 (40.0%)	6 (42.9%)	0.862
	Positive	15 (60.0%)	8 (57.1%)	
TLC	Normal	10 (40.0%)	5 (35.7%)	0.792
	Abnormal	15 (60.0%)	9 (64.3%)	
Plt	Normal	16 (64.0%)	8 (57.1%)	0.673
	Low	9 (36.0%)	6 (42.9%)	
Blood culture	Gram negative	8 (32.0%)	5 (35.7%)	0.182
	Gram positive	1 (4.0%)	3 (21.4%)	
	No growth	16 (64.0%)	6 (42.9%)	
Coagulation profile	Normal	20 (80.0%)	9 (64.3%)	0.281
	Prolonged	5 (20.0%)	5 (35.7%)	

CRP: C- Reactive Protein, TLC: Total Leucocytic Count, Plt: Platelet Count

As regards the laboratory results on initiation of ventilation, both groups had similar sepsis screen (CRP, TLC, platelet count and blood culture results) as well as the coagulation profile results.

		S group		F group		P-value
		n=25	%	n= 14	%	
Apnea	No	17	68.0%	7	50.0%	0.268
	Yes	8	32.0%	7	50.0%	
PDA	No	17	68.0%	10	71.4%	0.824
	Yes	8	32.0%	4	28.6%	
Pulmonary hypertension	No	22	88.0%	9	64.3%	0.079
	Yes	3	12.0%	5	35.7%	
BPD	No	25	100.0%	11	78.6%	0.016
	Yes	0	0.0%	3	21.4%	
NEC	No	21	84.0%	11	78.6%	0.672
	Yes	4	16.0%	3	21.4%	
Received inotropes	No	11	44.0%	5	35.7%	0.614
	Yes	14	56.0%	9	64.3%	
VAP	Negative	22	88.0%	10	71.4%	0.196
	Positive	3	12.0%	4	28.6%	

Table 4: Comparison of comorbidities between the "S" and "F" groups

PDA: Patent Ductus Arteriosis, BPD: Bronchopulmonary Dysplasia
NEC: Necrotizing Enterocolitis, VAP: Ventilator Associated Pneumonia

Both groups were still comparable as regards other comorbidities throughout their hospitalization stay as shown in the previous table.

Table 5: Comparison of the patient outcomes between the "S" and "F" groups

		S group n=25	F group n=14	P-value
Duration of ventilation (days)	Median (IQR) Range	3 (3-5) 1-7	5 (3-10) 2-18	0.088
Received Surfactant	No Yes	22 (88%) 3 (12%)	7 (50%) 7 (50%)	0.009
Length of NICU stay (days)	Median (IQR) Range	23 (19-31) 6-60	22.5 (13-29) 4-60	0.404
Mortality	died	5 (20%)	8 (57.1%)	0.018

The failure group had considerably higher rate of surfactant administration as well as higher mortality. Otherwise, there was not any considerable difference in the duration of ventilation or even the length of hospital stay.

Table (6): Comparison of the ventilator settings and pH and pCO_2 before extubation between the "S" and "F" groups.

Before extubation		S group n = 25	F group n = 14	P-value
pH	Mean ± SD	7.36 ± 0.04	7.33 ± 0.06	0.181
	Range	7.3 – 7.5	7.27 – 7.49	
$pvCO_2$ mmHg	Mean ± SD	40.92 ± 7.34	44.64 ± 8.37	0.157
	Range	27 – 56	30 – 60	
Mode	PSV	3 (12.0%)	0 (0.0%)	0.120
	SIMV	20 (80.0%)	10 (71.4%)	
	PTV	2 (8.0%)	4 (28.6%)	
PIP (cmH_2O)	Mean ± SD	13.24 ± 1.79	14.07 ± 1.86	0.178
	Range	10 – 17	12 – 17	
PEEP (cmH_2O)	Mean ± SD	5.08 ± 0.64	5.29 ± 0.83	0.392
	Range	4 – 6	4 – 7	
MAP (cmH_2O)	Mean ± SD	6.91 ± 1.20	7.64 ± 0.66	0.043
	Range	4.9 – 8.8	6.4 – 8.5	
It (seconds)	Mean ± SD	0.39 ± 0.03	0.38 ± 0.03	0.358
	Range	0.3 – 0.4	0.3 – 0.4	
FiO_2	Median (IQR)	0.21 (0.21 – 0.3)	0.3 (0.25 – 0.35)	0.015
	Range	0.21 – 0.4	0.21 – 0.5	
Rate (BPM)	Mean ± SD	35.60 ± 9.05	42.86 ± 4.69	0.008
	Range	25 – 50	35 – 50	
SBT	Success Fail	21 (84.2%) 4 (15.8%)	5(36.4%) 9(63.6%)	0.007

$pvCO_2$: pressure venous carbon dioxide, PIP: positive inspiratory pressure, PEEP: positive end expiratory pressure, MAP: mean airway pressure, IT: inspiratory time, RR: respiratory rate, FiO_2: fractioned inspired oxygen, BPM: breath per minute, SBT: Spontaneous breathing test

As regards the VBG prior to extubation, both groups were comparable. The ventilator mode and the majority of the settings were similar between the groups except for the MAP, FiO2 used and the rate, where a considerable difference was found

and shown in the above table. The SBT was done prior to extubation in both groups, and the number of patients who passed the SBT was significantly more in the group who was successfully extubated compared to the other group.

Table 7: Comparison of the "S" and "F" groups' pH and PvCO2 values, ventilator settings, and post-extubation X-ray results

After extubation		S group	F group	P-value
		n = 25	n = 14	
pH	Mean ± SD	7.33 ± 0.05	7.35 ± 0.08	0.378
	Range	7.22 – 7.4	7.27 – 7.48	
$pvCO_2$ (mmHg)	Mean ± SD	44.08 ± 6.87	46.86 ± 11.77	0.356
	Range	34 – 59	31 – 63	
X-ray	White lung	0 (0.0%)	3 (21.4%)	0.107
	Clear	14 (56.0%)	3 (21.4%)	
	Collapse	3 (12.0%)	2 (14.3%)	
	Hazziness	6 (24.0%)	4 (28.6%)	
	Patch	1 (4.0%)	0 (0.0%)	
	Increased BV markings	0 (0.0%)	1 (7.1%)	
	Hyperinflation	1 (4.0%)	1 (7.1%)	
Mode	CPAP	9 (36.0%)	0 (0.0%)	0.010
	NIPPV	16 (64.0%)	14 (100.0%)	
PIP (cmH_2O)	Mean ± SD	14.22 ± 1.80	16.36 ± 1.65	0.002
	Range	11 – 18	14 – 20	
PEEP (cmH_2O)	Mean ± SD	5.68 ± 0.80	6.36 ± 1.01	0.027
	Range	5 – 7	5 – 8	
IT (seconds)	Mean ± SD	0.38 ± 0.04	0.38 ± 0.03	1.000
	Range	0.3 – 0.45	0.3 – 0.4	
FiO_2	Median (IQR)	0.21 (0.25 – 30)	0.4 (0.3 – 0.5)	0.385
	Range	0.21 – 40	0.3 – 0.6	
RR(BPM)	Mean ± SD	32.94 ± 6.86	40.71 ± 7.81	0.006
	Range	25 – 50	30 – 55	

$pvCO_2$: Partial Pressure Venous Carbon Dioxide, Increased BV markings: Increased bronchovascular markings, PIP: Positive Inspiratory Pressure, PEEP: Positive End Expiratory Pressure, MAP: Mean Airway Pressure, IT: Inspiratory Time, RR: Respiratory Rate, Fio_2: Fraction of Inspired Oxygen, BPM: breath per minute, NIPPV: Non Invasive Positive Pressure Ventilation, CPAP: Continuous Positive Airway Pressure

Post extubation, both groups underwent VBG which had similar results in both groups. 64% of the patients of the success groups needed NIPPV post extubation while 100% of the failure group needed the NIPPV with a p-value of 0.006.

Table 8: Validity of SBT to accurately predict successful extubation

SBT	S group	F group	p-value
	n = 25	n = 14	
Success	21(84.2%)	5(36.4%)	0.007
Fail	4(15.8%)	9(63.6%)	

Parameter	Accuracy	Sensitivity	Specificity	PPV	NPV
SBT	76.7	63.6	84.2	80.0	70.0

SBT: Spontaneous breathing test PPV: Positive predictive value, NPV: Negative predictive value

Our main target was to validate the SBT and assess its accuracy in forecasting the extubation readiness of the ventilated newborns. 84.2% of neonates who were extubated successfully passed the SBT while 15.8% of them failed the SBT. On the other hand, in the group who failed extubation and needed to be re-intubated within 48 hours,

36.4% passed the SBT prior to their extubation with a p-value of 0.007. This significant difference allowed the assessment of the accuracy, sensitivity and specificity of the SBT as shown in table (8).

DISCUSSION:

There is a significant shortage of recommendations and standards for the assessment of extubation readiness in newborns at the bedside[12] . Our research aimed to confirm the accuracy of SBT in predicting ventilated newborns' readiness for weaning.

We recruited 50 ventilated neonates between 27 and 42 weeks of gestation in this trial. Four of them passed away while being intubated, four patients were unintentionally extubated prior to SBT, and three patients experienced pneumothorax and were thus disqualified from our study. Therefore, we studied at the 39 ventilated newborns. Depending on whether or not their extubation trial was successful, they were split into success "S" groups and failure "F" groups.

Compared to the success group, whose mean gestational age was 34.4 weeks, the failure group's mean gestational age was 32 weeks, with a lower birthweight. However, there was no statistical difference in weight or gestational age between the two groups. This was comparable to a study by Chico et al., who noted that gestational age and weight had no bearing on their extubation trial failure rate [12]. On the other hand, Zhang et al. and Singh et al. stated that lower gestational ages and those who are of lower weights are more likely to experience extubation failure [13, 1].

When the sepsis lab findings were analyzed, the two groups were comparable. This was in line with the findings of Hiremath et al., who showed that sepsis was not a reliable indicator of extubation failure [14]. Contrarily, Chawla et al. discovered that patients who had trouble weaning had a higher sepsis rate [15].

Those who failed extubation had a considerably greater mortality rate. This was also in line with the findings of Chawla et al., who showed that the death rate in their failure group increased by five times [15].

Weaning failure was substantially more common in individuals who received surfactant during their course of treatment compared to those who did not. The findings of Zhang et al., who showed that newborns who failed extubation were more likely to have received surfactant, supported this result [13]. This may be explained by the fact that a greater percentage of patients who received surfactant failed their subsequent weaning attempt due to their worse respiratory state from the beginning.

Only three of the patients had BPD, but since they were all in the failure group, it's possible that BPD poses a failure risk. Additionally, Chawla et al. showed that infants with BPD had a higher likelihood of experiencing weaning trial failure [15].

Higher PIP, PEEP, and MAP ventilatory settings were required for patients whose further attempts at extubation failed in compared to those whose weaning was successful. This may be explained by the fact that patients who required higher ventilator pressures when ventilation was first started were more likely to have started out with more severe lung pathology, and it's possible that serious lung injury resulted, increasing the chance for weaning failure later.

In comparison to the success group, the pre-extubation ventilation settings of respiratory rate, MAP, and FiO_2 were greater in the failure group. Bhat et al. and von Merkel et al. agreed with us on the greater FiO_2 needed by patients who failed weaning later on [16, 17].

In contrast to the CPAP, there was a considerably higher incidence of NIPPV in

the F group compared to the S group with regard to the non-invasive ventilation method that was required after extubation. Additionally, we observed that the F group required greater settings for post-extubation non-invasive breathing than the other group. Because of their severe respiratory state, patients in the F group had a higher frequency of post-extubation atelectasis, which required higher positive pressures to recruit the lung.

The current study showed that SBT had an 84.2% specificity and a 63.6% sensitivity for predicting successful extubation. According to a research by Chawla et al., SBT exhibited a 92% sensitivity and 50% specificity as a predictor for successfully extubating preterm infants[(7)]. In their study, Zhang et al. found comparable outcomes because only 26% of patients who passed the SBT required reintubation due to dyspnea [(13)]. This was comparable to a research on preterm neonates that found that patients who passed the SBT had a considerably higher chance of successfully extubating themselves [(18)].

Conclusion:

In conclusion, SBT is a valid predictor test for successful weaning from mechanical ventilation in neonates. It can be added as a final step in the NICU protocol of ventilation weaning. It is suggested that further extensive research be done on this result using larger sample sizes.

Conficts of interest:

No competing interests of financial or personal nature

The manuscript is not under considera-tion elsewhere.

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هل اختبار محاوله التنفس التلقائي صالح للتنبؤ بنجاح عمليه فطام حديثي الولادة من على جهاز التنفس الصناعي؟ دراسة مستقبلية استرشادية

بسمه شحاته و ايه شبانه

قسم طب الأطفال- كلية الطب- جامعة عين شمس

المقدمة: لا زال تحديد التوقيت الأمثل لفطام حديثي الولادة من جهاز التنفس الصناعي يمثل تحديا كبيرا و ذلك لتقليل المدة علي جهاز التنفس الصناعي و تجنب البقاء لفترات طويله دون داع و أيضا تجنب الفطام المبكر. من المقترح أن اختبار محاوله التنفس التلقائي يكون اختبارا إكلينيكيا للتنبؤ بنجاح عمليه فطام الأطفال من على جهاز التنفس الصناعي خاصة في وحدات حديثي الولادة ذات الموارد المحدودة التي قد لا يوجد بها الموجات فوق الصوتية علي الرئة أو الأساليب الأكثر تطورا.

الهدف من الدراسة: تهدف هذه الدراسة للتحقق من صحة اختبار محاوله التنفس التلقائي كاختبارموضوعي حاسم سريريا للتنبؤ بنجاح عمليه فطام الأطفال حديثي الولادة من على جهاز التنفس الصناعي.

المرضى و أساليب البحث: دراسة مراقبة مستقبلية استرشادية تمت على 50 من أطفال حديثي الولادة و المبتسرين تتراوح أعمارهم الرحمية من 27 إلى 42 أسبوعا. 4 منهم توفوا و هم لا يزالون على جهاز التنفس الصناعي و هناك 4 آخرون تم فصلهم عن جهاز التنفس الصناعي بالخطأ قبل عمل اختبار محاوله التنفس التلقائي ذلك بالإضافة إلى حدوث استرواح الصدر لثلاث مرضى و تم استبعادهم جميعا من الدراسة. قرار الفصل من على جهاز التنفس الصناعي تم بواسطة الطبيب المقيم حسب حالة المريض الإكلينيكية و حالة الدورة الدموية ذلك بالإضافة إلى تحليل غازات الدم. تم عمل اختبار محاوله التنفس التلقائي لل39 طفل حديث الولادة المتبقين قبل الفصل من على جهاز التنفس الصناعي و تم تدوين نتيجته. قسمنا المرضى حسب نجاح أو فشل عمليه الفطام من جهاز التنفس الصناعي إلى مجموعتين.

النتائج: قمنا بتتبع 39 مريضاً الذين قمنا بتقسيمهم إلى مجموعتين حسب نجاح عمليه الفطام من جهاز التنفس الصناعي إلي: (1) مجموعة النجاح؛ وشملت هذه المجموعة 25 مريضا (2) مجموعة الذين فشلت محاولة فصلهم و هي تحتوي على 14 مريضا.وقد وجدنا أن 84.2% من مجموعة النجاح اجتازت اختبار التنفس التلقائي قبل عملية الفصل مقارنة ب 36.3% من المجموعة التي فشلت في عملية الفصل. و توصلنا أن اختبار التنفس التلقائي لديه دقه بنسبه 63.6٪ وخصوصية 84.2٪ لمعرفة دقة التنبؤ بنجاح عمليه الفطام من جهاز التنفس الصناعي.

الإستنتاج: اختبار محاوله التنفس التلقائي اختبارموضوعي حاسم للتنبؤ بنجاح عمليه فطام الأطفال حديثي الولادة من على جهاز التنفس الصناعي. و يمكن إضافته لبروتوكول العمل في وحدات رعاية حديثي الولادة و المبتسرين كخطوة نهائية لابد من اجتيازها قبل الفصل من جهاز التنفس الصناعي.