

Conclusion Ethnic differences in lung volumes exist and cannot be accounted for by a simple correction factor. Current paediatric plethysmographic reference equations are not appropriate, and may lead to misdiagnosis unless limits of normality are adjusted. Caution in interpretation is recommended until more appropriate reference equations can be developed. This requires prospective plethysmographic lung volume data collection using standardised protocols in children from different ethnic backgrounds.

REFERENCES

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P138 EVALUATION OF THE NEED FOR A COMPREHENSIVE ASSESSMENT OF LUNG FUNCTION PRE OPERATIVELY IN THE MORBIDLY OBESE

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A Renton, D A Lonsdale, G V Miller, J S White. *York Teaching Hospital NHS Foundation Trust, York, UK*

Introduction and Objectives Chronic morbid obesity has been shown to impinge on normal respiratory function and can ultimately result in respiratory failure. Lee *et al* (2010) concluded that a more physiological assessment of individuals in this group is required when they are investigated clinically. Accordingly, the clinical pathway of patients referred for bariatric surgery at York Hospital was changed to include comprehensive Pulmonary Function Tests (PFT's), as well as the current standard Overnight Pulse Oximetry. The objective was to evaluate the revised clinical service and distinguish if the additional measurements are appropriate for morbidly obese patients as part of their surgical pre-assessment.

Methods Data were collected from patients undergoing bariatric pre-surgical assessment, between January 2011 and June 2011. PFT's undertaken included dynamic lung volumes, static lung volumes and transfer factor for carbon monoxide (TL_{CO}), using a Medgraphics Plethysmograph system in accordance with recognised standards. Overnight oximetry was performed using Minolta 300i pulse oximeters. Abnormalities of lung function were determined using the BTS (1997) guidelines. Obstructive sleep apnoea (OSA) was diagnosed using the Scottish Intercollegiate Guidelines Network, (2003) guidelines.

Results A total of 59 patients were included in the study with demographics and measurements summarised in Abstract P138

table 1. 28.8% had normal lung function and no evidence of OSA, 39% had evidence of OSA but normal lung function. 6.8% had abnormal lung function but no OSA and 25.4% had both abnormal lung function and evidence of OSA.

Conclusions Va and FRC_{Pleth} are reduced in all groups but is more significant in both groups with abnormal lung function. Those with combined abnormalities are on average 14.8 and 6 years older than those with no abnormalities or just OSA respectively suggesting the development of these co-morbidities with age. We feel that the finding that 32.2% of bariatric referrals were found to have abnormal lung function justifies the inclusion of these measurements when assessing this category of patient. Also, further assessment following weight loss in order to establish the underlying nature of deficient lung function would be useful.

P139 THE USE OF VENTURI MASKS WITH OXYGEN CONCENTRATORS

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J C T Pepperell, C Fraser, G McClue. *Taunton and Smerset NHS Foundation Trust, Taunton, UK*

Background Venturi masks are commonly used in the hospital setting to deliver controlled percentages of oxygen. This is important for those at risk of hypercapnic respiratory failure and to accurately assess ventilation and gas exchange. Hospital oxygen supplies deliver high velocity and pressure, which are required for Venturi masks to operate as designed. Home oxygen is commonly delivered via concentrators, which work at lower pressures and this may affect the performance of Venturi masks if they are requested for home use.

Aim We aimed to review the oxygen delivered by the concentrator and the performance of Venturi barrels (24%, 28% 31% and 35%) with the Intensity concentrator at the usual flow rates used.

Methods Venturi barrels from the three manufacturers were tested using a TSI® Certifier® FA Test system, pressure gauge, flow metre and oxygen sensor. The Intensity concentrator was set at the specified flow rate and allowed to stabilise, oxygen concentration and outlet pressure were noted. We attached the Venturi barrels and recorded the flow rate, back pressure and delivered oxygen concentration. If the Venturi under performed we adjusted the concentrator to deliver the stated FiO₂ and noted the flow rate required.

Results The concentrator delivered between 95.8 % and 84.7% oxygen, with concentration reducing at higher flows (see Abstract

Abstract P138 table 1 Summary of demographic and respiratory data for pre bariatric surgery patients

	All subjects n=59	Abnormal PFT's n=4	OSA n=23	Abnormal PFT's & OSA n=15	No abnormalities n=17
Males	n=21	n=2	n=9	n=7	n=3
Females	n=38	n=2	n=14	n=8	n=14
Age (yrs)	44.5±11.37	38.8±16.76	46.0±6.39	52±9.79	37.2±12.44
BMI (Kg/m ²)	48.2±7.40	43.3±5.56	48.6±7.79	47.2±8.61	49.9±5.90
SpO ₂ (%)	96.7±3.36	97.8±1.50	96.3±4.52	95.8±3.10	97.6±1.32
Spirometry	Normal=47	Normal=3	Normal=23	Normal=5	Normal=17
Pattern	Obstructive=4 Restrictive=8	Obstructive=0 Restrictive=1	Obstructive=0 Restrictive=0	Obstructive=3 Restrictive=7	Obstructive=0 Restrictive=0
FVC (%pred)	96.05±16.27	86.25±4.76	103.83±10.89	75.80±7.88	105.71±11.94
FRC _{pleth} (%pred)	76.50±16.76	67.00±22.73	82.14±15.37	75.85±22.24	71.94±10.80
TL _{CO} (%pred)	100.34±14.49	89.50±17.33	104.65±13.76	94.33±15.00	102.35±12.37
V _A (%pred)	89.00±13.45	78.75±5.12	94.61±10.95	75.40±10.08	95.82±10.14
K _{CO} (%pred)	113.75±18.94	112.50±20.42	110.83±13.74	126.07±22.77	107.12±17.53

Data presented as n or mean±SD.

PFT's, pulmonary function tests; OSA, obstructive sleep apnoea; BMI, body mass index; SpO₂, saturation of peripheral oxygen; FVC, forced vital capacity; % pred, percent predicted; FRC_{pleth}, functional residual capacity measured by plethysmography; TL_{CO}, Transfer factor of the lung for carbon monoxide; V_A, alveolar volume; K_{CO}, Transfer coefficient of carbon monoxide.