

161 - ANALYSIS OF PRESSURES IN PATIENTS MAXIMUM RESPIRATORY PREOPERATIVE BARIATRIC SURGERYRAFAEL DEMÉTRIO DA SILVA
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rafademétrio@hotmail.com**INTRODUCTION**

Obesity is the most important nutritional disorder in the developed world, with around 10% of its population are considered obese. Among other factors, physical inactivity plays a key role in the induction and maintenance of the disorder in Western societies.

The etiological classification is based on the type of obesity more than their putative mechanisms and treatment. The main types of obesity include the hypothalamus, endocrinology, nutrition, appropriate physical inactivity, genetics and drug-induced. In both classification schemes for several subtypes. Thus, this multiplicity means that regular exercise is only one aspect of prevention or treatment, although it probably interacts with several metabolic and regulatory mechanisms, for example, hyperinsulinemic, ATPase activity, activity of the receptor site and peripheral lipolysis.

No individual with morbid obesity, excess fat stored in the abdominal cavity has a direct mechanical effect on the thoracic cage and diaphragm, restricting chest expansion, with consequent reduction in lung volumes, even with the respiratory system without pathological changes. This restriction of the chest wall to expand the sitting position in obese individuals is 70% of the total resistance and, in the supine position, it increases to 80% of the total respiratory resistance, which leads to muscle overload for ventilation, resulting in dysfunction the respiratory muscles.

As Toneto, obesity is a chronic, multifactorial, most often incurable, it can be life threatening when it reaches more serious, and is then called morbid or severe (TONETO et al., 2004).

Obesity is the excessive accumulation of body fat, enough to put their health at risk. Can be defined as a percentage of total body fat in the constitution more than 20% in men and 27% in women. Its cause may be genetic, endocrine, environmental, cultural, socioeconomic, psychosocial or a combination of two or more risk factors. (Regenga, 2000).

Obesity is a universal disease of increasing prevalence that is acquiring epidemic proportions alarmingly, is a major public health problems of modern society (MANCINI, 2002).

For Cabral, morbid obesity is presented by body mass index (BMI) over 40 kg / m² or, BMI may be between 35 kg / m² and 40 kg / m² and have comorbidities.

Severe obesity can be associated, as can be the precursor of various chronic diseases, and may still result in a malfunction of the respiratory, circulatory, heart, kidney and others.

There are several causes that can lead to morbid obesity, as poor eating habits, hormonal or metabolic disorders, but in 70% of cases genetic factors are decisive.

Patients with morbid obesity should be viewed as having a serious disease that threatens life, reduces the quality of life and self-esteem, and increases the cost of living, requiring efficient approaches to promote weight reduction in order final.

The goal of treatment is to achieve a large fat metabolic balance, achieving adequate serum levels of glucose, cholesterol, uric acid, balancing blood pressure, and improve osteoarticular problems, respiratory, psychological and many other consequential obesity.

Weight loss and maintenance have been one of the toughest medical challenges. Because of this and other factors that prevent the loss and especially weight maintenance, the clinical treatment of obesity becomes mostly frustrating.

Bariatric surgery is the only scientifically proven method that promotes a strong and lasting weight loss, reducing mortality rates, and solving or at least minimizing a number of diseases associated with obesity (Cabral, 2000).

According Auler Jr. (2003), obesity requires profound changes in the respiratory system and metabolism. With the increasing deposition of fat lining the chest cavity, and both inside and on the abdominal cavity, progressive changes occur in lung function, such change involves a decrease in functional residual capacity (Costa et al, 2003).

The change in functional residual capacity due to: the mechanical compression of the thoracic cavity, and a reduction in dimensions by the anatomical adipose tissue mass coating by reducing the expiratory reserve volume, and reduction in residual volume. The reduction in expiratory reserve volume can lead to abnormal distribution ventilation / perfusion, and also because the abdomen being distended by excess adipose tissue can be elevated diaphragm (Costa et al, 2003).

The increase in mechanical work of breathing also leads to a higher oxygen consumption. Obesity can lead to the development of apnea and hypopnea, sleep, which in turn constitutes a risk factor for cardiovascular disease and premature death (Garrido Jr., 2002).

Considering that such changes usually occur on lung function in obese, bariatric surgery and still attacking mainly the region of the diaphragm, these patients have a higher propensity to develop respiratory complications postoperatively.

Respiratory muscle strength will be evaluated through the manometer, made with the manometer, which is measured the maximal inspiratory and expiratory pressures (MIP and MEP). For the test the patient should be seated comfortably at an angle of 90 degrees in hips and knee. To measure the MIP, the patient must undergo maximal inspiration with a nose clip against the occluded valve to verify the MEP, the patient perform a maximal expiration with the nose clip also against same valve. For both pressures will be held three sessions with an interval of 45 seconds per move and the highest value, recorded in cmH₂O, were selected. The values obtained are compared with the normal parameters by means of prediction equations for MIP and MEP.

The assessment of muscular endurance will be accomplished through the manometer (in position as described earlier) that consist of the following, the individual will be instructed to breathing in and out against the occluded valve manometer.

After the procedures used by the dental patients will be taken for disinfection, which is performed as follows: wear gloves and wash the mouth in contaminated water and immerse them in a solution of sodium hypochlorite at 1% dilution of 1:2 for 30 minutes in a plastic tub with lid. Remove material and rinse the immersion in water, then dry them with paper towel and pack in plastic bags for reuse.

All patient data will be recorded and analyzed using Microsoft Excel.

The data obtained from the survey will be presented only at scientific meetings, which preserved the identities of

patients. There will be no disclosure of images.

METHODOLOGY

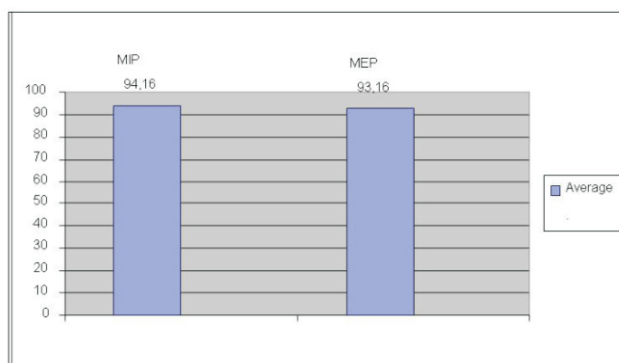
Descriptive study, based on results obtained from patient records at the Rehabilitation Center FAG of Cascavel-PR in patients undergoing tests manovacomtria, pre-operative obesity surgery.

For the test the patient should be seated comfortably at an angle of 90 degrees in hips and knee. To measure the MIP, the patient must undergo maximal inspiration with a nose clip against the occluded valve to verify the MEP, the patient perform a maximal expiration with the nose clip also against same valve. For both pressures will be held three sessions with an interval of 45 seconds per move and the highest value, recorded in cmH₂O, were selected. The values obtained are compared with the normal parameters by means of prediction equations for MIP and MEP according to the criteria of the Brazilian Society of Pulmonology and Tsiologia.

RESULTS

This study was conducted with the purpose of evaluating the respiratory mechanics of patients undergoing bariatric surgery, the results obtained after a long period were found, the average MIP patients 94.16 ± 22.89 and MEP $94, 16 \pm 23.57$. Respiratory muscle strength, measured by MIP and MEP, as existing methods have been studied extensively in recent decades as an effective technique for assessing respiratory muscle strength.

Chart 1: Mean Maximum Respiratory Pressures



Source: Author, 2010

DISCUSSION

The MEP is a measure that indicates the strength of intercostal and abdominal muscles while MIP indicates the strength of the diaphragm. However, most authors consider that MIP responds to force the set of all the respiratory muscles. Anyway this is that when measures vary widely, allow us to conclude that there were variations in the strength of respiratory muscles. Because of these variations of force characterize changes in the dynamics of respiration, are certainly responsible for changes in respiratory mechanics.

To Azeredo (2002), through careful and systematic measurement of MEP and the MEP, one can determine the weakness, fatigue and failure of respiratory muscles. The values considered normal for a young adult are: respiratory muscle weakness: MIP = - 70cmH₂O to - 45 cmH₂O. Respiratory muscle fatigue: MIP = - 40cmH₂O a - 25cmH₂O. Respiratory muscle failure: MIP: less than or equal to - 20cmH₂O.

Analyzing the initial average of MEP observed that the patients had a mean value lower than expected for a young adult, because it says based on what Regenga (2000), the normal value of MEP for a young adult is + a + 100cmH₂O 150cmH₂O, and the patients average pre-operative + 93.16 ± 23.57 cmH₂O. In relation to MIP, the patients were within the expected value.

For the results cited above obtivéssemos some points were important for this survey, we used the device manometer to measure the strength of respiratory muscles, because, according to Regenga (2000), this valuation method is considered simple and effective .

As COSTA Et. al 2003 in their studies with 29 subjects with mean age 43 ± 13 years obtained the MEP of 73 ± 20.83 cm/H₂O, going against the findings of the patients.

Another author found that the results of MEP was reduced PAISANOS al 2005 ET where he analyzed 21 patients of both sexes have the result of MEP with 96.2 ± 25.2 cm/H₂O.

The smallest variation in the MIP. can be justified by the fact that the carrying out of inspiration, a process that is fully active, ie, it requires muscle strength especially the diaphragm its greatest representative, for it is necessary a respiratory mechanics without amendments, in obese patient that does not happen often.

This minor effect on the values of MIP and MEP can be explained by the fact that the obese have a high overload, thereby promoting a training effect on the respiratory muscles, which could result in minor reduction of MIP and MEP.

The location of the deposit of fat also influences the ventilatory function and the more central (or android), the greater the damage. The function of respiratory muscles and diaphragmatic movement are also changed due to restrictions in the chest caused by adipose tissue (PAISANOS, and Chiavegato FARESIN, 2005 and Pereira, and Francischi BOAT-JR, 2003).

CONCLUSION

It is observed that morbidly obese patients who are on the waiting list for obesity surgery have a mean value lower than expected for the adult population, which brings us to the need to increase muscular strength and respiratory physiotherapy intervention preoperative.

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ANALYSIS OF PRESSURES IN PATIENTS MAXIMUM RESPIRATORY PREOPERATIVE BARIATRIC SURGERY ABSTRACT

Introduction Obesity is the most important nutritional disorder in the developed world, with around 10% of its population are considered obese. No individual with morbid obesity, excess fat stored in the abdominal cavity has a direct mechanical effect on the thoracic cage and diaphragm, restricting chest expansion, with consequent reduction in lung volumes, even with the respiratory system without pathological changes. Objective: To measure maximal respiratory pressures through the manometer: MIP and MEP in preoperative patients to bariatric surgery. Methods: The sample consisted of 30 patients of both sexes aged over 18 who are on the waiting list for obesity surgery, diagnosed with morbid obesity and who were referred for physiotherapy treatment by doctor gastroenterologist. Respiratory muscle strength was measured by manometer, made with the manometer, where the pressures were measured maximum inspiratory and expiratory pressures (MIP and MEP). The values obtained are compared with the normal parameters by means of prediction equations for MIP and MEP according to the guidelines of the Brazilian Society of Thoracic. The measurements were made in the Gymnasium of Cardiopulmonary Physical Therapy, Faculty Gurgacz Assisi - FAG, from July 2010 to September 2010. Results: We found an average of Respiratory muscles from 94.16 ± 22.89 cm/H2O and maximal expiratory pressure of 93.16 ± 23.57 cm/H2O. Conclusion: It is observed that morbidly obese patients who are on the waiting list for obesity surgery have a mean value lower than expected for the adult population in relation to the maximum expiratory pressure, which brings us to the need to increase the forces respiratory muscle action and pre-operative physiotherapy.

KEYWORDS: manometer, Physical Therapy, Bariatric Surgery.

ANALYSE DES PRESSIONS MAXIMALES RESPIRATOIRES CHEZ LES PATIENTS PRÉOPÉRATOIRE CHIRURGIE BARIATRIQUE RÉSUMÉ

Introduction L'obésité est le trouble nutritionnel le plus important dans le monde développé, avec environ 10% de sa population sont considérés comme obèses. Aucune personne souffrant d'obésité morbide, l'excès de graisse stockée dans la cavité abdominale a un effet mécanique direct sur la cage thoracique et le diaphragme, en limitant l'expansion thoracique, avec une réduction conséquente du volume pulmonaire, même avec le système respiratoire, sans modifications pathologiques. Objectif: mesurer les pressions maximales respiratoires par le manomètre: MIP et MEP en préopératoire à la chirurgie bariatrique. Méthodes: L'échantillon se composait de 30 patients des deux sexes âgés de plus de 18 ans qui sont sur la liste d'attente pour la chirurgie de l'obésité, diagnostiqué avec une obésité morbide et qui ont été soumis à un traitement de physiothérapie par le médecin gastro-entérologue. force des muscles respiratoires a été mesurée par le manomètre, faite avec le manomètre, où les pressions ont été mesurées des pressions maximales inspiratoires et expiratoires (MIP et MEP). Les valeurs obtenues sont comparées avec les paramètres normaux au moyen d'équations de prédiction pour le PPI et le député européen conformément aux lignes directrices de la Société brésilienne de thoracologie. Les mesures ont été effectuées dans le gymnase de cardio-thérapie physique, Faculté Gurgacz Assise - FAG, partir de Juillet 2010 à Septembre 2010. Résultats: Nous avons trouvé une moyenne de muscles respiratoires à partir de $94,16 \pm 22,89$ cm/H2O et maximale de la pression expiratoire $93,16 \pm 23,57$ cm/H2O. Conclusion: Il est observé que les patients souffrant d'obésité morbide qui sont sur la liste d'attente pour la chirurgie de l'obésité ont une valeur moyenne plus faible que prévu de la population adulte par rapport à la pression expiratoire maximal, ce qui nous amène à la nécessité d'accroître les forces l'action des muscles respiratoires et de la physiothérapie préopératoire.

MOTS-CLÉS: manomètre, la thérapie physique, la chirurgie bariatrique.

ANÁLISIS DE PRESIONES EN PACIENTES MÁXIMA RESPIRATORIAS PREOPERATORIA CIRUGÍA BARIÁTRICA RESUMEN

Introducción La obesidad es el trastorno nutricional más importante en el mundo desarrollado, con alrededor del 10% de su población son considerados obesos. Ninguna persona con obesidad mórbida, el exceso de grasa almacenada en la cavidad abdominal tiene un efecto mecánico directo sobre la caja torácica y el diafragma, lo que restringe la expansión torácica, con la consiguiente reducción de los volúmenes pulmonares, incluso con el sistema respiratorio, sin cambios patológicos. Objetivo: Medir las presiones respiratorias máximas a través del manómetro: PIM y MEP en pacientes en el preoperatorio de la cirugía bariátrica. Métodos: La muestra estuvo constituida por 30 pacientes de ambos sexos mayores de 18 años que están en lista de espera para cirugía de la obesidad, con diagnóstico de obesidad mórbida y que fueron remitidos para tratamiento de fisioterapia por el médico gastroenterólogo. la fuerza de los músculos respiratorios se midió por el manómetro, hecho con el manómetro, donde las presiones se midieron las presiones máximas inspiratoria y espiratoria (PIM y MEP). Los valores obtenidos se comparan con los parámetros normales por medio de ecuaciones de predicción para MIP y diputado al Parlamento

Europeo de acuerdo con las directrices de la Sociedad Brasileña de Cirugía Torácica. Las mediciones se realizaron en el Gimnasio de cardiopulmonar Terapia Física, Facultad Gurgacz Asís - FAG, a partir de julio 2010 a septiembre 2010. Resultados: Se encontró un promedio de los músculos respiratorios de $94,16 \pm 22,89$ cm/H20 y la presión espiratoria máxima de $93,16 \pm 23,57$ cm/H20. Conclusión: Se observa que los pacientes con obesidad mórbida que están en la lista de espera para cirugía de la obesidad tienen un valor medio inferior a lo esperado para la población adulta en relación a la presión espiratoria máxima, que nos lleva a la necesidad de aumentar las fuerzas acción de los músculos respiratorios y la fisioterapia preoperatoria.

PALABRAS CLAVE: manómetro, Fisioterapia, Cirugía Bariátrica.

ANÁLISE DAS PRESSÕES RESPIRATÓRIAS MÁXIMAS EM PACIENTES PRÉ-OPERATÓRIOS DE CIRURGIA BARIÁTRICA

RESUMO

Introdução A obesidade é o distúrbio nutricional mais importante do mundo desenvolvido, já que cerca de 10% de sua população são considerados obesos. No indivíduo portador de obesidade mórbida, o excesso de gordura armazenada na cavidade abdominal exerce efeito mecânico direto sobre a caixa torácica e o músculo diafragma, restringindo a expansibilidade torácica, com conseqüente redução dos volumes pulmonares, mesmo diante do sistema respiratório sem alterações patológicas. **Objetivo:** Mensurar as pressões respiratórias máximas através da Manovacuometria: PImáx e a PEmáx em pacientes pré-operatórios de cirurgia bariátrica. **Metodologia:** A amostra foi composta de 30 pacientes, de ambos os sexos, com idade superior a 18 anos, que se encontram na fila de espera para a cirurgia da obesidade, com diagnóstico de obesidade mórbida e que foram encaminhados para o tratamento fisioterápico pelo médico gastroenterologista. A força muscular respiratória foi avaliada através da manovacuometria, feita com o manovacuômetro, onde foram mensuradas as pressões inspiratórias e expiratórias máximas (PImáx e PEmáx). Os valores obtidos serão comparados com os parâmetros de normalidade por meio das equações de predição para PImáx e PEmáx segundo as diretrizes da Sociedade Brasileira de Pneumologia e Tisiologia. As mensurações foram realizadas no Ginásio de Fisioterapia Cardiopulmonar da Faculdade Assis Gurgacz – FAG, no período de Julho de 2010 a Setembro de 2010. **Resultados:** Encontrou-se média de Pressão Inspiratória Máxima de $94,16 \pm 22,89$ cm/H20 e Pressão Expiratória Máxima de $93,16 \pm 23,57$ cm/H20. **Conclusão:** Observa-se que os pacientes obesos mórbidos que se encontram na fila de espera para a cirurgia da obesidade apresentam um valor médio abaixo do esperado para a população adulta em relação à pressão expiratória máxima, o que nos remete a necessidade de incremento das forças musculares respiratórias e a intervenção pré-operatória fisioterápica.

PALAVRAS-CHAVE: Manovacuometria, Fisioterapia, Cirurgia Bariátrica.