100 - EVALUATION OF VO2MAX IN MORBIDLY OBESE PRE-BARIATRIC SURGERY

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INTRODUCTION

The maximum oxygen consumption is the best variable used to determine and classify the cardiorespiratory fitness of a person (AMERICAN COLLEGE OF SPORTS MEDICINE, 2006). It represents the maximum amount of oxygen that can be captured, transported and consumed by cellular metabolism, while a person performs dynamic exercise involving a large percentage of muscle mass. It is also known as maximal aerobic power for its measurement is described both in a relative and in an absolute manner by volume of oxygen (or milliliters liters) per minute (Kruel et al. 2003). The form takes into account the relative weight (ml.Kg-1.min-1), which is the most used because the energy needs vary by body weight (Denadai, 1995).

In the obese population is considered an important parameter to analyze morbidities associated with high weight, and the quantification of the highest oxygen uptake (O2) by an individual is due to the interaction of the respiratory, cardiovascular and muscular, because the maximal oxygen uptake is dependent on the pulmonary uptake, transport and use by the circulation mitochondrial (Araujo, 2002). Due to this interaction, there are factors intrinsic to these systems that end up limiting the maximum oxygen consumption. The study therefore aimed to assess cardiorespiratory fitness by maximal oxygen consumption of obese pre-bariatric surgery by applying the Balke protocol, a protocol which is consistent with assessments of groups with lower cardiorespiratory fitness or have limitations the magnitude of the stride, as is the case of overweight patients (ROWLAND; paddy fields; Walsh, 1990). After the testing was to analyze the data obtained.

The morbidly obese population presents anatomical and physiological changes that hinder the uptake of oxygen and therefore have values below when compared with non-obese population (ZANCONATO et al., 1989; GORAN et al., 2000; EKELUND et al., 2004; Loftin, et al. 2004).

DEVELOPMENT

It is a cross-sectional quantitative study aimed at determining the maximal oxygen consumption in obese patients undergoing bariatric surgery, in order to verify the cardiorespiratory pre surgery. The population was addressed morbidly obese who are on the waiting list for bariatric surgery. They attend the sessions of physical therapy at the Clínica de Reabilitação-FAG. We excluded patients who had cardiac disease, chronic degenerative diseases, smoking or bone deformities that prevented testing. Patients with cognitive disorders who do not understand the procedure were not assessed, and those not medically released.

The selection of an appropriate protocol for assessment of functional capacity is of fundamental importance (McArdle, Katch, Katch, 1992).

The modified Balke protocol is the best method for people who had obesity, chronic degenerative diseases or children, for being a constant speed and less intense (3.4 mph or 5.47 km / h). To implement the Balke protocol were used treadmill, a stethoscope and sphygmomanometer to measure blood pressure, pulse oximetry to capture the heart rate and oxygen saturation. The test was performed in Cardiopulmonary Physiotherapy Gym at Clínica de Reabilitção-FAG with 14 patients who carry bariatric surgery at the Hospital São Lucas FAG sequentially. Blood pressure, heart rate, respiratory rate and O2 saturation were collected before and after the test. The patient was explaining the whole procedure after testing and was referred to the treadmill. The protocol consists of a test that has constant speed, starting with tilt zeroed after 2 minutes the incline starts with 2% in the 4th minute of testing the inclination to spend 4%, in the 6th minute to tilt vai 6% at 8 ° inclination minutes increased to 8% at 10 ° slope will minutes to 10% at 12 ° inclination is increased to 12% at 14 ° slope goes to 14% at 16 ° will tilt to 16%, being the inclination final stages totaling 9. The patient can stop the test at any time, if not longer bear the realization of physical activity.

After the tests, the calculation of maximum oxygen uptake was done by mathematical formula: VO2max = (1.75 x maximum tilt supported) + 6.10 ml/kg/min-1 in that part of the protocol used. Due to the need for interaction of the respiratory, cardiovascular and muscular, there are intrinsic factors that end up limiting VO2max. Among these limitations are decreased pulmonary ventilation and diffusion deficit that cause a desaturation and consequently decrease the VO2max. Since ventilation is compromised by anatomical changes that impair the expansion and dissemination of that deficit is due to a low cardiac output, because the oxygenation depends on cardiac output.

RESULTS

The sample consisted of 14 patients, 3 males and 11 females. The age range was between 21 to 50 years. Of the 14 obese patients who perform the test none has achieved the last stage of the test, and the maximum was reached the stage 7 comprising a 12% incline at least stage and the stage one has reached which corresponds to 0% incline. After the tests, the calculation of maximum oxygen uptake was done by mathematical formula that is part of the protocol used. The results obtained ranged from 10.6 to 31.6 ml/kg/min-1 ml/kg/min-1, and the mean VO2max for this group of patients was 23.4 ± ml / kg / min -1. Thus, through the average obtained is possible to consider that obese patients have evaluated the maximum oxygen consumption below normal when compared with non-obese individuals, and these usually have the VO2max value of between 30 and 35 ml / kg / min -1.

CONCLUSIONS

Through research we can conclude that the Balke protocol is indicated for the assessment of maximal oxygen uptake in the obese population, and was easily applied and demonstrated values relative to body mass. According to the results, we found that the obese population has compromised cardiorespiratory fitness as presents values of maximum oxygen consumption low when compared to the normal population.

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EVALUATION OF VO2MAX IN MORBIDLY OBESE PRE-BARIATRIC SURGERY

ABSTRACT

Introduction: Obesity is now a major public health problem, because the heavy weight, coupled with a sedentary lifestyle, is directly related to pathological conditions that cause high morbidity and mortality. Several interventions are used to improve health and therefore the quality of life of obese patients. The VO2max is a variable that should be assessed and monitored in the obese population, because it is an important parameter associated morbidities, and the quantification of the highest oxygen uptake by an individual is due to the interaction of the respiratory, cardiovascular and muscular. Objective: To evaluate the maximal oxygen uptake of morbidly obese individuals preoperative bariatric surgery: Methods: We evaluated 14 patients between 21 and 50 years, 3 patients were male and 11 female patients. These patients already have the date marked bariatric surgery, which will happen in the next 6 months. They signed an informed consent form and the project was approved by the IRB of the institution. Individuals performing treadmill exercise test following the protocol of Balke. Results: Of 14 patients evaluated to date, the average maximal oxygen uptake was 20.3 ml/kg/min-1 found. Conclusions: we found that the obese population has compromised cardiorespiratory fitness as presents values of maximum oxygen consumption low when compared to the normal population.

KEYWORDS: Obesity. VO2max. Bariatric Surgery.

ÉVALUATION DES VO2MAX EN OBÉSITÉ MORBIDE PRÉ-CHIRURGIE BARIATRIQUE

RESUME

Introduction: L'obésité est devenue un problème majeur de santé publique, parce que le poids lourd, couplé à un mode de vie sédentaire, est directement liée à des conditions pathologiques qui entraînent une morbidité et une mortalité élevées. Plusieurs interventions sont utilisées pour améliorer la santé et donc la qualité de vie des patients obèses. La VO2max est une variable qui doit être évaluée et surveillée dans la population obèse, car il est un paramètre important morbidités associées, et la quantification de l'absorption maximale d'oxygène par un individu est due à l'interaction de l'appareil respiratoire, cardio-vasculaire et musculaire. Objectif: évaluer la consommation maximale d'oxygène de personnes souffrant d'obésité morbide chirurgie bariatrique préopératoire: Méthodes: Nous avons évalué 14 patients entre 21 et 50 ans, 3 patients étaient de sexe masculin et 11 patients de sexe féminin. Ces patients ont déjà la date indiquée chirurgie bariatrique, qui aura lieu dans les 6 prochains mois. Ils ont signé un formulaire de consentement éclairé et le projet a été approuvé par l'IRB de l'institution. Les personnes effectuant le test sur tapis roulant selon le protocole de Balke. Résultats: Sur les 14 patients évalués à ce jour, la consommation d'oxygène maximale moyenne était de 20,3 ml/kg/min-1 trouvé. Conclusions: nous avons constaté que la population obèse a compromis la capacité cardiorespiratoire que présente les valeurs de consommation maximale d'oxygène faible par rapport à la population normale.

MOTSCLÉS: Obésité. VO2max. Chirurgie bariatrique.

EVALUACIÓN DE VO2MAX EN OBESIDAD MÓRBIDA PRE-CIRUGÍA BARIÁTRICA

RESUMEN

Introducción: La obesidad es actualmente un importante problema de salud pública, debido a que el peso pesado, junto con un estilo de vida sedentario, está directamente relacionada con las condiciones patológicas que causan alta morbilidad y mortalidad. En varias intervenciones se utilizan para mejorar la salud y por lo tanto la calidad de vida de los pacientes obesos. El VO2max es una variable que debe ser evaluado y controlado en la población obesa, debido a que es un parámetro importante morbilidades asociadas, y la cuantificación de la captación máxima de oxígeno por un individuo se debe a la interacción de los sistemas respiratorio, cardiovascular y muscular. Objetivo: Evaluar el consumo máximo de oxígeno de las personas con obesidad mórbida la cirugía bariátrica preoperatorio: Métodos: Se evaluaron 14 pacientes entre 21 y 50 años, 3 pacientes eran hombres y 11 eran mujeres. Estos pacientes ya tienen la fecha marcada cirugía bariátrica, lo que va a pasar en los próximos 6 meses. Ellos firmaron un formulario de consentimiento informado y el proyecto fue aprobado por el IRB de la institución. Los individuos de hacer una prueba de esfuerzo siguiendo el protocolo de Balke. Resultados: De los 14 pacientes evaluados hasta la fecha, la captación máxima de oxígeno promedio fue de 20,3 ml/kg/min-1 encontrado. Conclusiones: se encontró que la población obesa ha puesto en peligro la capacidad cardiorrespiratoria como se presentan los valores de consumo de oxígeno máximo bajo en comparación con la población normal.

PALABRAS CLAVE: Obesidad. VO2max. Cirugía Bariátrica.

AVALIAÇÃO DO VO2MÁX EM OBESOS MÓRBIDOS PRÉ-CIRURGIA BARIÁTRICA

RESUMO

Introdução: A obesidade é hoje um dos principais problemas públicos de saúde, pois o peso elevado, juntamente com o sedentarismo, está diretamente relacionado com condições patológicas que causam altas taxas de morbidade e de mortalidade. Várias intervenções são utilizadas para melhorar a saúde e conseqüentemente a qualidade de vida dos pacientes obesos. O VO2 máx é uma variável que deve ser avaliada e monitorada na população obesa, pois é um importante parâmetro de morbidades associadas, sendo que a quantificação da mais alta captação de oxigênio por um indivíduo é decorrente da interação dos sistemas respiratório, cardiovascular e muscular. Objetivo: Avaliar o consumo máximo de oxigênio de indivíduos obesos mórbidos no pré-operatório de cirurgia bariátrica: Métodos: Foram avaliados 14 pacientes entre 21 e 50 anos, sendo 3 paciente do sexo masculino e 11 pacientes do sexo feminino. Esses pacientes já estão com a data da cirurgia bariátrica marcada, as quais irão acontecer nos próximos 6 meses. Os mesmos assinaram o TCLE e o projeto foi aprovado pelo CEP da instituição. Os indivíduos realizam teste de esforço ergométrico seguindo o protocolo de Balke. Resultados: Dos 14 indivíduos avaliados até o momento, a média do consumo máximo de oxigênio encontrado foi de 20,3 ml/kg/min-1. Conclusões: foi possível identificar que a população obesa tem o condicionamento cardiorrespiratório comprometido, pois apresenta valores de consumo máximo de oxigênio baixo quando comparados a população normal.

PALAVRAS-CHAVE: Obesidade. VO2 máx. Cirurgia Bariátrica.