

20 - EVALUATION OF BRONCHODILATOR RESPONSE OF SHORT ACTION IN FEET OF PATIENTS WITH DIFFERENT AGE GROUPS

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INTRODUCTION

Asthma is characterized as an inflammatory disease of the airways, which is chronic, multifactorial and complex in nature. Its symptoms include cough and / or chest tightness, wheezing and dyspnoea, which result from an inflammatory process, from an exaggerated response to the exposure of various stimuli (GINA, 2015). This inflammatory process results in reduced respiratory flow and the symptoms are totally or partially ceased, spontaneously in some cases and in others, specific treatment for asthma is required (SBPT, 2012).

Approximately 300 million people worldwide have asthma, affecting between 10-20% of the general population and 20-30% of children in Brazil (BRAZIL, 2015).

Its diagnosis is based on data acquired through history, associated with physical examination (GINA, 2015). In order to assist in the diagnosis, management and treatment of chronic respiratory diseases, it is essential to perform pulmonary function tests, which allow to evaluate the changes in pulmonary flow and volumes during forced expiration (VIDAL, MATTIELO, JONES, 2013; LEE et al., 2014).

Among these exams, spirometry is the one that objectively determines the degree of airway obstruction by two measures, forced expiratory volume in one second (FEV1) and forced vital capacity (FVC). The diagnosis of airflow limitation is established by the reduction of the FEV1 / FVC ratio, also known as the Tiffeneau index, which has different intensities, which are determined by the percentage reduction in FEV1 in relation to its predicted (SBPT, 2012).

In addition to detecting airflow limitation for the diagnosis of asthma, there should be a significant demonstration of partial or complete reversibility of the condition after inhalation of a short-acting bronchodilator (SBPT, 2012).

The use of the bronchodilator has a great impact on the clinical management of asthmatic patients, however, there are still few studies in the literature comparing the bronchodilator response in patients of different ages. Therefore, the objective of the present study is to evaluate the pre and post-use FEV1 of bronchodilator in asthmatic patients of different age groups and to verify if there is a significant difference in the response of the bronchodilator to children, adolescents, adults and the elderly.

MATERIALS AND METHODS

A cross-sectional observational study was carried out at the Multiprofessional Outpatient Clinic of the University Hospital of the West of Paraná (HUOP), Physiotherapy sector, located in the city of Cascavel, Paraná. The study included all asthmatic patients who visited the outpatient clinic from January 2015 to December 2016, and who underwent pulmonary function tests using spirometry using the MicroLab Spirometer MK8 ML3500 spirometer and for spirometric data reading Spida 5 program. The examination consisted of a pre-bronchodilator phase and a post-bronchodilator phase, obtained after administration of 400 mg of inhaled salbutamol.

The sample was divided into four groups according to the age group of the patients, GC (child group): included patients up to twelve years of age incomplete; GA (adolescent group): patients between twelve and eighteen years of age, both according to the Statute of the Child and Adolescent (BRASIL, 1990); GAD (adult group): patients aged between 19 and 59 years; and GE (elderly group): patients aged 60 or over, according to the Elderly Status (BRASIL, 2003). Patients who failed to complete the pulmonary function examination adequately and those who lacked data on the medical chart were excluded.

The data collected were age, gender, associated comorbidities, smoking, use of medication for asthma, pulmonary symptoms, sedentary lifestyle, knowledge about physical therapy in asthma, and pre and post bronchodilator FEV1 values.

The results were expressed through descriptive statistics and analyzed using the Statistical 7.0 program (STATSOFT, 2004). The ANOVA test was applied for repeated measurements, followed by the Tukey-NHSD follow-up test, adopting a significance level of 5%.

RESULTS

The total sample consisted of 112 patients, of whom 13 were excluded. The remaining 99 patients were divided into four groups according to their age group. The distribution and characteristics of the sample are shown in table 1, and the main symptoms presented in table 2.

Table 1 - Distribution and general characteristics of the patients.

Variable	GC	GA	GAD	GE
Sample number n (%)	25 (25,25%)	16 (16,16%)	31 (31,31%)	27 (27,28%)
Female n (%)	14 (56%)	10 (62,5%)	28 (90,32%)	23 (85,19%)
Male gender n (%)	11 (44%)	6 (37,5%)	3 (9,68%)	4 (14,81%)
Age (years), Mean ± SD	8,28±1,48	14,75±1,77	50,16±9,20	70,40±6,23
Physical activity practice n (%)	20 (80%)	8 (50%)	18 (58,06%)	5 (18,52%)
Asthma medication n (%)	22 (88%)	15 (93,75%)	19 (61,29%)	22 (81,48%)

GC: Child Group; GA: Adolescent Group; GAD: Adult Group; GE: Elderly Group. Values expressed in number (n), percentage (%) and mean ± standard deviation when applicable.

Table 2 - Main symptoms presented.

Symptom	GC (n=25)	GA (n=16)	GAD (n=31)	GE (n=27)
Dyspnea	7 (28%)	3 (18,75%)	29 (93,55%)	21 (77,78%)
Wheezing	14 (56%)	7 (43,75%)	20 (64,52%)	15 (55,55%)
Cough	15 (60%)	4 (25%)	15 (48,39%)	13 (48,15%)
Expectoration	4 (16%)	4 (25%)	16 (51,61%)	10 (37,04%)

GC: Child Group; GA: Adolescent Group; GAD: Adult Group; GE: Elderly Group. Values expressed in number (n), percentage (%) and mean ± standard deviation when applicable.

Regarding the associated comorbidities, 2 patients (8%) of the GC had heart disease. None were found in GA, 80,64% (25 patients) of the GAD and 92,59% (25 patients) of the GE presented as main comorbidities, Systemic Arterial Hypertension (SAH), Diabetes Mellitus (DM), gastrointestinal diseases and Disease Chronic Obstructive Pulmonary Disease (COPD).

Regarding smoking, the sample was divided into non - smokers, current smokers, ex - smokers and passive smokers, as shown in table 3.

Table 3 - Data related to smoking.

	GC (n=25)	GA (n=16)	GAD (n=31)	GE (n=27)
Smoking				
No n (%)	25 (100%)	16 (100%)	15 (48,39%)	16 (59,26%)
Current n (%)	-	-	-	2 (7,41%)
Ex smoker n (%)	-	-	16 (51,61%)	9 (33,33%)
Smoking time (years ± SD)	-	-	21±10	28±17
Passive smoker n (%)	5 (20%)	5 (31,25%)	5 (16,13%)	10 (37,04%)

GC: Child Group, GA: Adolescent Group, GAD: Adult Group, GE: Elderly Group. Values expressed in number (n), percentage (%) and mean ± standard deviation when applicable.

Regarding the FEV1 variable, there was interaction between the pre and post bronchodilator moments ($F = 5.16$, $p = 0.002$). In an intragroup analysis, there was a significant difference in the different moments evaluated for the groups GA ($p < 0.001$) and GAD ($p < 0.001$), according to Figure 1.

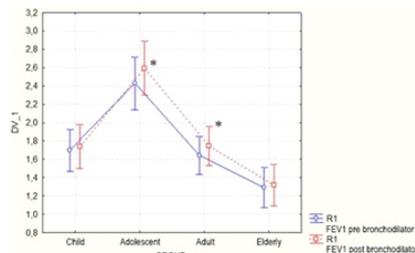


Figure 1. Graph of values of forced expiratory volume in the first second (FEV1) in the pre and post bronchodilator moments in the Child (GC), Adolescent (GA), Adult (GAD) and Elderly (GE) groups. * statistical difference in relation to the pre and post bronchodilator moment.

Finally, of the entire sample evaluated, only 45 patients (45,45%) reported having some knowledge about respiratory physiotherapy in asthma.

DISCUSSION

According to the International Study of Asthma and Allergies in Childhood, in 2006 the prevalence of asthma in Brazil was 24,3% in schoolchildren and 19% in adolescents (ASHER et al., 2006; SOLE et al., 2006), data that were similar to our findings, where asthmatic children represented 25,25% of the sample and adolescents 16,16%. Another study carried out with Brazilian adults showed a prevalence of asthma of 4,4% in the population over 18 years old, being higher in individuals aged between 18 and 29 years and lower in those aged over 80 years (MENEZES et al., 2013). In the present study, when the patients over 18 years of age were analyzed, the prevalence was higher in those aged 19-59 years (31,31%), and decreased in patients over 60 years old (27,28%).

Also in the study by Menezes et al (2013), the prevalence of asthma in adults was higher in female subjects and 80% of all patients used or had used some type of asthma medication. Both data corroborate with those found in the present study, where the prevalence of female asthma was greater not only in patients over 18 years of age, but in the total sample, with 87,93% and 75,75%, respectively. One of the hypotheses for a higher prevalence of female asthma is the fact that women appear to be more concerned about health and therefore seek medical attention more often, increasing the number of diagnoses of the disease in this sex. Although in adulthood most studies show a higher prevalence of asthma in women, studies performed during childhood show a higher prevalence in males (ALMQVIST, WORM, LEYNAERT, 2008). However, in the current study, prevalence, regardless of age.

Several comorbidities are related to poorer asthma control, negatively influencing patients' quality of life (Gershon et al., 2013). A 2011 study showed that allergic rhinitis, obesity, osteoporosis, gastroesophageal reflux disease, tuberculosis, hypertension and DM associated with asthma are frequent (CAZZOLA et al., 2011). In our study, in GAD and GE, the comorbidities SAH and DM were also found, being the most prevalent, followed by gastrointestinal diseases and COPD in both groups. In the GC it was found with low incidence, cardiac diseases, but no data were found in the literature that correlated the pathologies.

Exposure to tobacco, even if passive, has harmful effects on health (CHERAGHI, SALVI, 2009). Gonzalez-Barcala et al (2013) demonstrated that in their study with children and adolescents, 80,6% and 51,5%, respectively, were passive smokers. Lower percentages were found in our study, where 20% of the children and 31,25% of the adolescents were passive smokers.

Although no recent studies on asthma and smoking have been found, one group of authors reported that among asthma patients, the prevalence of active smokers may vary from 17% to 35% (THOMSON, CHOUDHURY, LIVINGSTON, 2004). Another study of 2009, with asthmatic patients, found 3% active smokers and 33% ex-smokers (DIAS-JÚNIOR, 2009). In our sample, only GE subjects were current smokers, with a small percentage of 7,41%. The percentage of ex-smokers in the GE of 33,33% was similar to the findings of the Dias-Júnior study (2009), in GAD, the rate was higher (51,61%), showing that apparently young adults are putting aside the habit of smoking. According to data from the IBGE (2014), the prevalence of smoking is decreasing over the years, due to the tobacco control actions that were developed.

In addition to the studies that show that smoking negatively influences the control of asthma and may increase the severity of the disease, some authors show that asthmatic smokers present more symptoms than asthmatic patients who are not smokers (SIROUX, 2000). Of the symptoms presented in the individuals in our sample, there was a higher prevalence of dyspnea, wheezing and expectoration in GAD individuals, although it was not the group that presented the largest number of active smokers, the group with the largest number of former smokers, a fact that may justify this higher prevalence of symptoms.

Asthma symptoms may be spontaneously discontinued, but in some cases require specific medications, such as bronchodilators (GINA, 2015; SBPT, 2012). Response to the bronchodilator is often indicated by pre and post bronchodilator variations in FEV1 and FVC, with FEV 1 being the most important functional parameter in bronchodilator response (GOLD, 2006). In the present study, the individuals responded significantly to the bronchodilator. However, when the groups were analyzed in isolation, only GA and GAD responded significantly.

Some patients may present a negative response to the bronchodilator, as in the case of individuals with intermittent asthma who are in the intercrise period, also in those compensated, or in patients with severe asthma, where the inflammatory process may persistently occur, or there may be a remodeling of the (GOLD, 2014; ISEMAN, CHAN, 2010), this may explain the reason why GE did not present a significant response to the bronchodilator. Since the GC did not present a significant response, it may be related to the fact that the children still do not present an obstructed airway obstruction.

Of the total sample studied, 51,51% of the patients practice regular physical activity, with a higher prevalence in children (80% of the individuals in this group), followed by adults (58,06%), adolescents (50%) and the elderly, with only 18,58%. Physical activity is beneficial for asthmatic patients, but many of them may present symptoms during their practice, especially dyspnea, a fact that ends up hampering their performance, since patients fear this triggering of symptoms (GINA, 2011; WESTERMANN et al., 2008; HEIKKINEN et al., 2012). This condition associated with the effects of aging itself is possibly one of the main factors in which the elderly are the least active among asthmatic patients. On the other hand, individuals with milder symptoms tolerate exercise well and thus achieve an improvement in the quality of life due to an improvement in aerobic conditioning, reduction of symptoms, anxiety levels and even depression (HEIKKINEN et al., 2012; MENDES et al., 2010; MANCUSO et al., 2013).

More than half of the sample (54,55%) reported lack of knowledge about the role of physical therapy in asthma, a specialty that has been shown to be effective for these patients, contributing to their well-being through respiratory techniques, strengthening of the respiratory muscles, improving the respiratory mechanics, besides bringing social and emotional benefits (PÓVOA, TANGANELLI, 2015), consequently improving their quality of life.

CONCLUSION

It is concluded, therefore, that FEV1 values increase after use of the bronchodilator in the different age groups and that its response is significantly better in adolescents and adults than in children and the elderly.

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EVALUATION OF BRONCHODILATOR RESPONSE OF SHORT ACTION IN FEET OF PATIENTS WITH DIFFERENT AGE GROUPS

ABSTRACT

Introduction: Asthma is characterized as a chronic inflammatory disease of the airways. The inflammatory process leads to a reduction in respiratory flow, and the symptoms that have been reported cease spontaneously or with specific treatment for asthma. Assisting in its diagnosis, management and treatment is essential to the performance of pulmonary function tests. Spirometry is the examination that objectively determines the degree of airway obstruction. For diagnosis, in addition to detecting airflow limitation, there must be a significant demonstration of total or partial reversibility of the condition after inhalation of a short-acting bronchodilator. Objective: To evaluate the pre and post-use FEV1 of the bronchodilator in asthmatic patients of different age groups and to verify if there is a significant difference in the response of the bronchodilator among children, adolescents, adults and the elderly. Methods: A cross-sectional observational study was carried out with 99 asthmatic patients by means of medical records, between January 2015 and December 2016, divided into four groups according to age group: GC (child group); GA (adolescent group); GAD (adult group); GE (elderly group). Results: when comparing FEV1 values before and after bronchodilator intergroups, there was interaction ($F = 5.16$, $p = 0.002$). When the intragroup analysis was performed, there was a significant difference in the different moments evaluated for the GA ($p < 0.001$) and GAD groups ($p < 0.001$). Conclusion: It is concluded that FEV1 values increase after use of the bronchodilator in different age groups and that its response is significantly better in adolescents and adults than in children and the elderly.

Key-words: Asthma; Bronchodilator Agents; Forced Expiratory Volume.

ÉVALUATION DU RAPPORT BRONCHODILATRICE À COURT TERME SUR LES PIEDS DE PATIENTS DE GROUPES D'ÂGE DIFFÉRENTS

ABSTRACT

Introduction: L'asthme est caractérisé comme une maladie inflammatoire chronique des voies respiratoires. Le processus inflammatoire conduit à une réduction du flux respiratoire, et les symptômes qui ont été rapportés cessent spontanément ou avec un traitement spécifique de l'asthme. Assister dans son diagnostic, la gestion et le traitement est essentiel à la performance des tests de la fonction pulmonaire. La spirométrie est l'examen qui détermine objectivement le degré d'obstruction des voies respiratoires. Pour le diagnostic, en plus de la détection de la limitation du débit d'air, il devrait y avoir une démonstration significative de la réversibilité totale ou partielle de la condition après l'inhalation d'un bronchodilatateur à courte durée d'action. Objectif: Évaluer le VEMS pré et post-utilisation du bronchodilatateur chez des patients asthmatiques de différents groupes d'âge et vérifier s'il existe une différence significative dans la réponse du bronchodilatateur chez les enfants, les adolescents, les adultes et les personnes âgées. Méthodes: Une étude observationnelle transversale a été menée auprès de 99 patients asthmatiques au moyen de dossiers médicaux, entre janvier 2015 et décembre 2016, répartis en quatre groupes selon le groupe d'âge: GC (groupe d'enfants); GA (groupe d'adolescents); GAD (groupe d'adultes); GI (groupe de personnes âgées). Résultats: en comparant les valeurs du VEMS avant et après les intergroupes bronchodilatateurs, il y avait une interaction ($F = 5,16$, $p = 0,002$). Lorsque l'analyse intragroupe a été effectuée, il y avait une différence significative dans les différents moments évalués pour les groupes GA ($p < 0,001$) et GAD ($p < 0,001$). Conclusion: On conclut que les valeurs du VEMS augmentent après l'utilisation du bronchodilatateur dans différents groupes d'âge et que sa réponse est significativement meilleure chez les adolescents et les adultes que chez les enfants et les personnes âgées.

Mots clés: Asthme; Agents bronchodilatateurs; Volume expiratoire force.

EVALUACIÓN DE LA REPOSTAAL BRONCODILADOR DE CORTA ACCIÓN EN EL VEF1 DE PACIENTES CON DIFERENTES BANDAS ETARIAS

RESUMEN

Introducción: El asma se caracteriza como una enfermedad inflamatoria crónica de las vías aéreas. El proceso inflamatorio acarrea en la reducción del flujo respiratorio, y los síntomas generados cesan de forma espontánea o con tratamiento específico para el asma. Auxiliando en su diagnóstico, manejo y tratamiento es fundamental la realización de las pruebas de función pulmonar. La espirometría es el examen que determina objetivamente el grado de obstrucción de las vías aéreas. Para diagnóstico, además de la detección de la limitación al flujo de aire, debe existir una demostración significativa de la reversibilidad total o parcial del cuadro después de inhalación de un broncodilatador de corta acción. Objetivo: Evaluar el VEF1 pre y post uso del broncodilatador, en pacientes asmáticos de diferentes edades y verificar si hay diferencia significativa en la respuesta del mismo entre niños, adolescentes, adultos y ancianos. Metodología: Estudio observacional transversal, realizado con 99 pacientes asmáticos mediante análisis de prontuarios, entre enero de 2015 y diciembre de 2016, los cuales fueron divididos en cuatro grupos de acuerdo con el grupo de edad: GC (grupo niño); (Grupo adolescente); GAD (grupo adulto); GI (grupo de edad avanzada). Resultados: cuando se compararon los valores del VEF1 pre y post broncodilatador intergrupos, hubo interacción ($F = 5.16$, $p = 0.002$). Cuando se realizó el análisis intragrupo, hubo diferencia significativa en los diferentes momentos evaluados para los grupos GA ($p < 0.001$) y GAD ($p < 0.001$). Conclusión: Se concluye que los valores del VEF1 aumentan después del uso del broncodilatador en las diferentes edades y que su respuesta es significativamente mejor en adolescentes y adultos que en niños y ancianos.

Palabras-clave: Asma; Broncodilatadores; Volumen Espiratorio Forzado.

AVALIAÇÃO DA REPOSTA AO BRONCODILADOR DE CURTA AÇÃO NO VEF1 DE PACIENTES COM DIFERENTES FAIXAS ETÁRIAS

RESUMO

Introdução: A asma é caracterizada como uma doença inflamatória crônica das vias aéreas. O processo inflamatório acarreta na redução do fluxo respiratório, e os sintomas gerados cessam de forma espontânea ou com tratamento específico para asma. Auxiliando no seu diagnóstico, manejo e tratamento é fundamental a realização dos testes de função pulmonar. A espirometria é o exame que determina objetivamente o grau de obstrução das vias aéreas. Para diagnóstico, além da detecção da limitação ao fluxo de ar, deve existir uma demonstração significativa da reversibilidade total ou parcial do quadro após inalação de um broncodilatador de curta ação. Objetivo: Avaliar o VEF1 pré e pós uso do broncodilatador, em pacientes asmáticos de diferentes faixas etárias e verificar se há diferença significativa na resposta do mesmo entre crianças, adolescentes, adultos e idosos. Metodologia: Estudo observacional transversal, realizado com 99 pacientes asmáticos mediante análise de prontuários, entre janeiro de 2015 e dezembro de 2016, os quais foram divididos em quatro grupos de

acordo com a faixa etária: GC (grupo criança); GA (grupo adolescente); GAD (grupo adulto); GI (grupo idoso). Resultados: quando comparados os valores do VEF1 pré e pós broncodilatador intergrupos, houve interação ($F=5.16$, $p=0.002$). Quando realizada a análise intragrupos, houve diferença significativa nos diferentes momentos avaliados para os grupos GA ($p<0.001$) e GAD ($p<0.001$). Conclusão: Conclui-se, que os valores do VEF1 aumentam após uso do broncodilatador nas diferentes faixas etárias e que sua resposta é significativamente melhor em adolescentes e adultos, do que em crianças e idosos.

Palavras chaves: Asma; Broncodilatadores; Volume Expiratório Forçado.

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