148 - VOLUMES MEASUREMENT AND LUNG CAPACITIES IN PREGNANT WOMEN FROM 28 TO 38 WEEKS

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INTRODUCTION

Physiotherapy is a field of knowledge under development. Every day brings new strategies and approaches to physiotherapy, providing for professionals to carry out a differential treatment with quality. (Redivo)

Among many tests that evaluate lung function, spirometry is considered the most useful additional exam to physical diagnosis and development of therapeutic program and discharge criteria. (Azeredo, 2002)

Spirometry flow is the standard test to assess lung function and its changes, including during pregnancy. Pregnancy prints important changes in women respiratory physiology, with 15% increase in the maternal metabolism rate. This extra demand is achieved to increase from 40 to 50% in respiratory minute volume of 7.5 L/min (liters/minute) to 10.5 L/min, resulting more from the increase in current volume than from changes in respiratory rate. This implies a 50% increase of pulmonary ventilation, with maintenance of respiratory rate (Neppelenbroek, 2005).

The pregnancy is a time period that lasts about nine months, when the woman sleeps, protects and takes into her body another human being that arouses from the encounter of male and female sex cells after the copulation moment. From this junction the pregnant woman's body goes through many changes involving several systems, including the respiratory one. It's modified both at micro or physiological level, and at macro or mechanical level. It's very important to understand the changes that happen on the physiology and mechanical ventilation of women during pregnancy. (Almeida, 2005)

The respiratory tracts permeability is increased and resistance is reduced, possibly by the action of progesterone. Also, this pregnancy hormone stimulates the respiratory center. This hyperventilation causes increased partial pressure of oxygen and reducing carbon dioxide partial pressure, with a decline of serum bicarbonate 18-22mmol/L. Therefore, breathing compatible with alkalosis is expected in pregnant woman, partially offset metabolic acidosis. So there's a decrease in functional residual capacity in pregnancy (Neppelenbroek, 2005)

Aiming respiratory discomfort experienced by pregnant women especially in the last weeks of pregnancy due to pulmonary compression by increased abdominal pressure, thinking about the importance of respiratory function and the need to fill a knowledge gap on pulmonary function in pregnant women is why this research has noted changes in pregnant women between 28th and 38th weeks of pregnancy.

As the interest in the public healthy policies and practices, it's important to study specific characteristics during pregnancy related to lung function in order to reduce complications associated with pregnancy.

MATERIALS AND METHODS

This research is characterized by a cross-sectional and quantitative study. This study is characterized by a cross-sectional and quantitative study. The sample included ten young pregnant women in the age 18-30 years, unigestas, between 28th and 38th week of pregnancy at the time of the examination, which attended the Health Unit of the November 14th District, located at Francisco Guaraná Menezes Street, number 682 at Cascavel, CEP: 85804050 where it was performed prenatal examinations and consultations.

This study includes the approval of the ethics committee of the Assis Gurcacz College, permission from the Municipal Healthy Secretary in Cascavel and Health Unit of the November 14th District. The voluntary pregnant women agreed with the research and signed individually Free and Clear Consent.

The study included healthy pregnant women, non-users of licit or ilict drugs, neuropathy, heart or lung disease who were between 28th and 38th weeks of pregnancy, performing prenatal at an authorized health unit.

An evaluate questionnaire was applied to pregnant women (Appendix A), then we performed the measurement of weight and height of each woman according to Viana 2008.

For evaluation of lung volume and capacity it was performed the spirometry with the Microlab 3300 spirometer By Micromedia Ltd. The measurement was carried out the spirometer coupled to a cavity on the upper face and for individual use. Then, the women were advised to rest for five to ten minutes, sitting on a chair inside the room where the examinations were performed, before they were made. After a period of rest, it was carefully described all the procedures for its realization, and it was forced expiratory maneuvers, using a nose clip. To carry the examination out, the participants remained seated keeping their chest upright and neutral head position. After several cycles of quiet breathing we requested a maximum oral expiration followed by a brief apnea and after it starts the maximum expiratory maneuver followed by a maximum forced expiration sustained until the capacity of the pregnant woman, according to the BTA criteria.

Data analysis after collecting them was performed by using graphs and tables at Microsoft Office Excel, and statistical analysis was performed using SPSS VERSION 15.0 comparing the respiratory capacity and volumes of each pregnant woman, and only higher values will be used among the three accomplishments of each examination, which were compared to normal values.

RESULTS

The average age of the pregnant study participants was 25.7 ± 4.81 years, gestational age of 34.7 ± 3.26 weeks, 80% are married, 20% single, 90% white, 10% brown; regarding the profession, 40% are housewives, 10 % kitchen maids, 10% maids, 10% clerks, 10% commercial manager, 10 % manicure and 10% unemployed. In the item schooling, 60% completed high school, 30% had incomplete high school, and 10% had incomplete higher education. All the patients attended the prenatal and then the rate of consultations between them was 8 ± 1.41. Three of the woman were primiparous, and seven had already had only one or more previous pregnancies, and only one had an abortion, the placenta was taken off and she was smoker for 15 years. Aiming symptoms during pregnancy, 33.3% reported feeling dyspnea, 20.0% tachycardia, 13.3% cough, 13.3% dizziness, 20.0% headache.

TABLE 1: Sample socioeconomic characteristics.

Characteristics	Case %
Marital Status	
Single	20%
Married	80%
Race	
White	90%
Brown	10%
Profession	
Housewives	40%
Kitchen maids	10%
Maids	10%
Clerk	10%
Commercial Manage	10%
Manicure	10%
Unemployed	10%
Schooling	
Incomplete high school	30%
Incomplete higher	10%
Education	
Complete high school	60%

Source: The Author

TABLE 2: Sample Symptomatology

Symptom	Cases %
Dispnea	33,3 %
Tachycardia	20,0 %
Cough	13,3 %
Dizziness	13,3 %
Headache	20,0 %

Source: The Author

Table 2 lists the symptoms reported by pregnant women in the study.

TABLE 3. Connection between the variables of pregnant women Pulmonary Function Tests in the study Volume and Lung Capacity in pregnant women between 28th and 38th week of pregnancy, in Cascavel 2010.

Variables	Average	Standard Deviation
FVC L/min	2,87	0,56
FEV1 L/min	2,60	0,49
FEV1% L/min	91,1	7,60
ETF L/min	2,31	0,89

Source: The Author

Table 3 shows the variables of Pulmonary Function Tests: Spirometry. In the table we can see an average FVC of 2.87 ± 0.56 l / min, FEV1 2.60 ± 0.49 l / min, FEV1% 91.1 ± 7.60 l / min and 2.31 ± 0.89 ETF l / min, and there weren't changes in the values of lung volumes and capacities.

DISCUSSION

Pulmonary function was analyzed in ten healthy pregnant women. The average age of the participants was 25, SD 7 ± 4.817791 years old. According to Viana 2008, the best maternal age at the reproductive point of view is between 20 and 2005 years old, with lower perinatal risk, however age is not the most important factor, but a risk factor in pregnancy are life complications and pregnant women's healthy, mainly related to quality care in prenatal and childbirth.

In relation to the symptoms during pregnancy, Martinelli says dyspnea is a complaint from 60 to 70% of pregnant women because during pregnancy there's an increase from 20 to 30% in oxygen consumption offset by a deeper breathing, which increases respiratory effort. The reduction in diffusion capacity and diaphragm elevation by the growing uterus also aggravate the sensation of breathlessness in pregnancy. In this study we can observe that 33,3% of the women study participants reported feeling dyspnea, a low value if compared to the value found at the study mentioned above.

Leocadio, 2007, reports that there's an increase in cardiac output of 30 to 60%, and tachycardia and other alternations in heart are frequent because a fraction of the blood volume is sent to non-muscle tissue, tachycardia can reach more than 100 bpm, according to cardiac output, blood volume increased about 35% and 50% and the greater plasma is where there's a “physiological anemia” in pregnancy. This study found that 100% of pregnant women, unlike the study above, there were a smaller number of reports of tachycardia, just 20% of women reported this symptom.

According to Barcelos, 2005, the highest incidence of tachycardia during pregnancy is still unknown, especially in the months close to delivery that may be caused by stress, anxiety and fatigue, very common at this time. In this study, tachycardia was observed in 20% of patients.

Literature indicates that for the diagnosis of abnormalities in lung function, values found in an individual should be compared with reference values obtained in healthy subjects (Duarte et al., 2007). Neppelembroek, 2005, conducted a study with 26 pregnant patients considered clinically normal, which were evaluated by a portable meter for measuring peak expiratory flow, and so he concluded that this flow does not change the outcome of pregnancy. Viana, 2008, when comparing high-risk pregnant women with normal pregnancies, found a statistical difference between the two groups in lung function in relation to the FEF 25-75%.

Redivo et al carried out a study with eight women in the third trimester of pregnancy, which underwent spirometry, and the author found that the values had decreased functional capacity, being considerable for his age as physiological, not pathological; what agrees with this study in which the values were not significant presentations of restriction, being in the physiological capacity.

By comparing the values obtained in this study with the reference values there were no significant changes that could characterize any obstruction or restriction in lung volumes, reporting that the volumes and capacities are within the normal range.

FINAL CONSIDERATIONS

The symptoms of higher percentage were dyspnea and tachycardia that did not correlate with the spirometry. Spirometric results were compared to normal values in healthy adults and there were no significant differences.

However, it can be concluded that spirometry values were not significant even with the increased weight of the patients during this period, thus not reflecting the outcome of pregnancy, related to quality of life, symptoms and mother and baby's health.

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VOLUMES MEASUREMENT AND LUNG CAPACITIES IN PREGNANT WOMEN FROM 28 TO 38 WEEKS

SUMMARY

Introduction: The pregnancy is a time period that lasts about nine months, when the woman sleeps, protects and takes into her body another human being. Then the pregnant woman's body goes through many changes involving several systems, including the respiratory one. It's very important to understand the changes that happen on the physiology and mechanical ventilation of women during pregnancy. Objective: To measure the volume and lung capacity in normal pregnant woman from 28 to 38 weeks through pulmonary function test and comparing it to literature findings. Methodology: This research is characterized by a cross-sectional and quantitative study. The sample included ten young pregnant women in the age 18-30 years, primiparous and unigestas who are between 28th and 38th weeks pregnancy that had prenatal care with the gynecologist at the Health Unit of the November 14th District at Cascavel – PR. A questionnaire was applied and a pulmonary function test was performed: Spirometry according to the Brazilian Society of Thoracic standards and approved by the Ethics Committee. Results: The mean age was 25,7 years with 37,5 weeks of pregnancy and an average of eight prenatal visits. In relation to the symptoms during pregnancy, 33,3 % of women reported dyspnea, 20,0% tachycardia, 13,3% cough, 13,3% dizziness and 20,0% headache. Spirometry found the following: FVC: 2.87 ± 0.56 l / min, FEV1 2.60 ± 0.49 l / min, FEV1% 91.1 ± 7.60 l / min and 2.31 ± ETF 0.89 l / min which is consistent with values within the normal ranged when it's compared to healthy adults. Conclusion: The symptoms with higher percentage were dyspnea and tachycardia which is not related to the spirometric test, even with all the physiological changes during this period, so it doesn't reflect on the pregnancy results.

KEYWORDS: Physiotherapy, Spirometry, Pregnancy.

MENSURATIONS DES VOLUMES ET CAPACITÉS PULMONAIRES EN FEMMES ENCEINTES DE 28 À 38 SEMAINES.

RÉSUMÉ

Introduction : Dans le moment de la grossesse la femme accommode, protège et accueille à l'intérieur de son corps un autre être. À partir de cela le corps de la femme enceinte passe par une série de changements, impliquant divers appareils et systèmes, parmi eux le respiratoire. Ainsi, c'est d'extrême importance de comprendre les changements qu'arrivent dans la physiologie et la mécanique ventilatoire de la femme pendant la période de la grossesse. Objectif : Mensurer les volumes et capacités pulmonaires en femmes enceintes normales de 28 à 38 semaines de grossesse à travers preuve de fonction pulmonaire et confronter avec les résultats littéraires. Méthodologie : Cette étude est un étude de coupe transversale et quantitative. L'échantillon consiste avec 10 jeunes femmes enceintes dans l'ordre de 18 à 30 ans, que soient entre la 28^{e}et 38e semaines de grossesse, lesquelles réalisent prénatal et ont été libérés par le gynécologue de l'université de Santé du quartier 14 de novembre dans la ville de Cascavel-Pr. Questionnaire a été appliqué et on été réalisée preuve de la fonction pulmonaire. Spirométrie selon les règles de la Société Brésilienne de Pneumologie et Phtisiologie approuvé par le comité d'éthique. Résultats : La moyenne d'âge a été de 25,7 ans, avec 37,5 semaines de grossesse et une moyenne de 8 consultations prénatales. Concernant les symptômes pendant la grossesse, 33,3% des femmes enceintes ont rapporté dispnéia, 20,0% tachycardie, 13,3% toux, 13,3% vertige et céphalée. La spirométrie a trouvé les suivantes donnés : CVF : 2,87±0,56 l/min, VEF1 2 ,60±0,49 l/min, VEF1% 91,1±7,60 l/min et FEF 2,31±0,89 l/min, ce qui est conforme avec valeurs dans la normalité quand comparé avec des adultes en bonne santé. Conclusion : Les symptômes de plus grand pourcentage ont été dispnéia et tachycardie ce qui ne présente pas relation avec l'examen spirométrique, même avec toutes les modifications physiologiques pendant cette période, ainsi ne répercutant pas dans les résultats de la grossesse.

MOTS-CLÉS : Physiothérapie, Spirométrie, Grossesse.

MENSURACIÓN DE VOLÚMENES Y CAPACIDADES PULMONARES EN LAS MUJERES EMBARAZADAS DE 28 A 38 SEMANAS

RESUMEN

Introducción: En la gestación la mujer acomoda, protege y acoge en su cuerpo a otro ser. Desde allí el cuerpo de la mujer embarazada pasa por una serie de cambios relativos a varios dispositivos y sistemas, incluyendo el tracto respiratorio. Por tanto, es de suma importancia comprender los cambios que se producen en la fisiología y en la mecánica ventilatoria de la mujer durante el embarazo. Objetivo: Medir los volúmenes y las capacidades pulmonares en mujeres con embarazo normal 28 a 38 semanas de gestación a través de las pruebas de función pulmonar y comparar los resultados literarios. Metodología: Este estudio es un corte transversal y cuantitativo. La muestra incluyó a 10 jóvenes embarazadas en la edad de 18 a 30 años, que estén entre 28º y 38º semanas de gestación, las cuales realizan prenatal y fueron liberadas por el ginecólogo de la Unidade de Saúde do Bairro 14 de Novembro en la ciudad de Cascavel-PR. Se aplicó un cuestionario y se realizó prueba de función pulmonar. Espirometría de conformidad con las normas de la Sociedade Brasileira de Pneumologia e Tisiologia y aprobado por el Comité de Ética. Resultados: La edad media fue de 25,7 años, con 37,5 semanas de gestación y un promedio de 8 visitas prenatales. En cuanto a los síntomas durante el embarazo, el 33,3% de las mujeres embarazadas relataron disnea, taquicardia 20,0%, 13,3% tos, 13,3% y el 20,0% cefalea. La espirometría encuentro los siguientes datos: CVF: 2,87±0,56 l/min, VEF1 2,60±0,49 l/min, VEF1% 91,1±7,60 l/min y FEF 2,31±0,89 l/min, lo cual es coherente con los valores dentro del rango normal en comparación con adultos sanos. Conclusión: Los síntomas de un mayor porcentaje fueron la disnea y la taquicardia que no presenta relación con la prueba de espirometría, incluso con todos los cambios fisiológicos durante este período, por lo tanto no refleja el resultado del embarazo.

PALABRAS CLAVE: Fisioterapia, Espirometría, Gestación.

MENSURAÇÃO DOS VOLUMES E CAPACIDADES PULMONARES EM GESTANTES DE 28 A 38 SEMANAS

RESUMO

Introdução O momento gestacional é um período que compreende cerca de nove meses, onde a mulher acomoda, protege e acolhe dentro do seu corpo outro ser. A partir disso o corpo da gestante passa por uma série de alterações, envolvendo diversos aparelhos e sistemas, dentre eles o respiratório. Assim, é de extrema importância compreender as alterações que acontecem na fisiologia e mecânica ventilatória da mulher durante o período gestacional. Objetivo: Mensurar os volumes e capacidades pulmonares em gestantes normais de 28 a 38 semanas de gestação através de prova de função pulmonar e confrontar com os achados literários. Metodologia: Este estudo se caracteriza por um estudo de corte transversal e quantitativo. A amostra consta com 10 gestantes jovens na faixa de 18 a 30 anos, primigestas e unigestas, que estejam entre a 28º e 38º semana gestacional, as quais realizam pré-natal e foram liberadas pelo ginecologista da Unidade de Saúde do Bairro 14 de Novembro na cidade de Cascavel-PR. Foi aplicado questionário e realizado prova de função pulmonar: Espirometria de acordo com as normas da Sociedade Brasileira de Pneumologia e Tisiologia e aprovado pelo Comitê de Ética. Resultados: A média de idade encontrada foi de 25,7 anos, com 37,5 semanas de gestação e média de 8 consultas pré-natais. Em relação aos sintomas durante a gravidez, 33,3% das gestantes relataram dispnéia, 20,0% taquicardia, 13,3% tosse, 13,3% tontura e 20,0% cefaléia. A espirometria encontrou os seguintes dados: CVF: 2,87±0,56 l/min, VEF1 2,60±0,49 l/min, VEF1% 91,1±7,60 l/min e FEF 2,31±0,89 l/min, o que condiz com valores dentro da normalidade quando comparado com adultos saudáveis. Conclusão: Os sintomas de maior porcentagem foram dispnéia e taquicardia o que não apresenta relação com o exame espirométrico, mesmo com todas as alterações fisiológicas durante este período, sendo assim não repercutindo nos resultados da gestação.

PALAVRAS-CHAVE: Fisioterapia, Espirometria, Gestação.