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ORIGINAL ARTICLE

Determine the Functional Limitations in Activities of Daily Living Through Short Physical Performance Battery Test Among Asthmatic Adults

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ABSTRACT

Background: To determine the functional restrictions in functional activities of daily lives in middle aged asthmatic adults and association of BMI with limitations in their daily life activities.

Method: An observational cross sectional study was carried out at pulmonology opd of Shalamar hospital. A sample of 36 diagnosed asthmatic adults of middle aged with moderate to severe allergic asthma was taken. A Purposive sampling technique was used to conduct the study. Prediction of functional limitations in everyday activities through Short Physical Performance Battery test was determined. Three series of tests named balance test, gait speed test, repeated chair stand test were conducted which were the part of short physical performance battery test. Each test scored 4 and there was the total of 12 score. Those subjects who had less than 10 score were at risk of limitations in their daily life activities in future.

Result: Sample of 30 participants were included for this study from age 35 to 55. Out of which 13 participants were of normal weight with BMI of less than 23.9 and 17 were overweight with the BMI ranges from 24.0 to 30.0. Participants with greater BMI were at the high risk of mortality. The results showed that the 13 subjects were overweight had the high risk of mortality, 13 had the risk of functional limitations in activities of daily living and 4 had the good functional status. There was statistical difference between the BMI and Short Physical Performance Battery test score. (P value= 0.001)

Conclusion: This study concluded that middle aged asthmatic adults with moderate allergic asthma had greater risk of functional limitations and high risk of mortality due to the disease effect. This study also showed that the predictive value of functional limitations was more pronounced in females with greater BMI than males.

Keywords: Allergic asthma, Activities of daily living, Functional Limitations, Short Physical Performance Battery test,

INTRODUCTION:

Asthma is a chronic airway inflammation which increases respiratory symptoms. The people with moderate to severe allergic asthma usually have lower functional capacity and restricted daily activities. (Oliveira et al., 2020). Asthma makes the breathing difficult, cough, wheezing sounds during breathing and in severe cases shortness of breath. The people with moderate to severe asthma seem to have reduced functional capacity and restricted daily activities. (Crimi et al., 1998)

Adults who are obese with asthma have more numbers of comorbidities, limited functional capacity and reduced daily life physical activity, which may exacerbate asthma symptoms. Physical exercise is recommended to decrease asthma attacks and improve outcomes. Exercise also improves psychological change in behavior due to disease. (Freitas et al., 2018)

ADL, a holistic term used to describe the activities that are necessary to live independently. The routine activities, such as eating, bathing, sleeping, dressing and mobility are called activities of daily living. Activities of daily living get limited with time as age related and with any disease that puts the patient in mobility restriction. Mortality and morbidity can predict through activities of daily living in older population. They further deteriorate muscle mass, muscle strength, cardiopulmonary endurance, mobility and transfer and make the person dependent. (Wang et al., 2020)

SPPB is the most commonly used method to examine functional restrictions in everyday activities . In this test there are further 3 series of tests named Balance Test, Gait Speed Test (4 meter walk) and chair sit to stand test which are performed by the subject. Each test scores out of 4 and there is the total of 12 score. Those subjects who have less than 10 score are at the risk of functional limitations in activities of daily living, instrumental activities of daily living and impair mobility in near future.(Stoffels et al., 2020)

METHOD

The subjects were recruited on the basis of inclusion and exclusion criteria by purposive sampling technique. After recruitment all the information about the test and procedure were provided to the subjects and written consent was signed from them. Basic demographs were documented. Data was collected in the pulmonology opd of Shalamar hospital. The whole process was conducted in 15 minutes for each subject. There was no risk to the participants. The procedure of data collection is as follows:

Three series of tests were conducted which are the part of SPB test. The subjects have been requested to perform balance test in which they had to stand in side by side, semi tandem and tandem position for 10 seconds. Then they were scored. The score ranges from 0 to 4. 4 is maximum performance. Then, subjects were requested to do the gate speed test in which they walked at normal pace for 4 meters. Then they were scored. The score ranges from 0 to 4. Lastly, subjects were asked to do the chair stand test in which they performed the 5 repetitions of sit to stand and they were scored. The score ranges from 0 to 4. 4 is the maximum performance.

A score 12 indicates the highest degree of physical performance in daily routine and good functional capacity. A score less than 10 indicated one or more mobility and functional limitations in ADLs and more deterioration in near future. This research provided the knowledge about those subjects who need preventive measures and physical therapy management to prevent the restrictions in ADLs .

RESULT

Total number of participants was 30 with age 35 to 55 shown in table -1. Out of which 13 participants were of normal weight with BMI of less than 23.9 and 17 were overweight with the BMI ranges from 24.0 to 30.0. Participants with greater BMI were at the high risk of mortality. The results showed that the 13 subjects were overweight had the high risk of mortality, 13 had the risk of restrictions in ADLs and 4 had the good functional status shown in figure 2. There was statistical difference between the BMI and SPB test score.(P value= 0.001)

Table 1:

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	17	56.7	56.7	56.7

	Male	13	43.3	43.3	100.0
	Total	30	100.0	100.0	

Table 2:

Chi-Square Tests						
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	11.909[a]	2	.003	.001		
Likelihood Ratio	13.456	2	.001	.001		
Fisher's Exact Test	12.173			.001		
Linear-by-Linear Association	9.583[b]	1	.002	.002	.002	
N of Valid Cases	30					

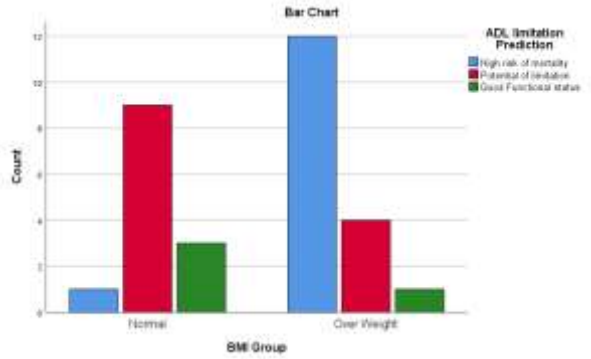

Figure 1

DISCUSSION

This study shows that middle aged asthmatic adults with moderate allergic asthma have greater risk of functional limitations and high risk of mortality due to the disease effect. This study also concludes that the predictive value of functional limitations is more pronounced in females with greater BMI than males and there is significant difference in BMI and short physical battery test score. (P value=0.001) There are the limited studies that reported the potential risk of functional limitations in middle aged asthmatic adults. One study proposed that people with difficult to control asthma have limited activities of daily living and low performance. The most convenient and used test to examine functional performance in chronic respiratory disease is 6MWT but it is difficult to perform because of the requirement of considerable space to conduct so instead of using 6MWT, short physical performance battery test (side to side stand, 4 meter walk test, chair sit to stand) is cheap, feasible and easy to conduct and require small space to test the functional capacity and status of everyday activities. The prediction of limitations in ADLs in young adults due to the pulmonary conditions through SPPB test is very convenient to conduct.(Oliveira et al., 2020) but this study didn't give the knowledge of risk of functional limitations in moderate to severe diagnosed asthmatic adults of middle aged. And also there is no information of weight and BMI with short physical performance battery test score.

Larrson evaluated variations in SPB test scores in patients of COPD after pulmonary rehabilitation of 4 weeks. SPPB scores have shown improvement after pulmonary rehabilitation. The changes in Short physical performance battery test score were not associated with changes in exercise capacity or dyspnea scores. The SPPB could be a useful tool for evaluating physical performance or functioning in patients with chronic obstructive pulmonary disease before and after pulmonary rehabilitation.(Larsson et al., 2018)So, according to this current study SPPB test is a useful tool for evaluating the physical performance and limitations in ADLs amongmiddle aged asthmatic adults.

CONCLUSION

This study concluded that middle aged asthmatic adults with moderate allergic asthma had greater risk of functional limitations and high risk of mortality due to the disease effect. This study also showed that the predictive value of functional limitations was more pronounced in females with greater BMI than males.

REFERENCES

1. MATTIUZZI, C. & LIPPI, G. Worldwide asthma epidemiology: insights from the Global Health Data Exchange database. International forum of allergy & rhinology, 2020. Wiley Online Library, 75-80.
2. OLIVEIRA, J. M. D., SPOSITON, T., CERCI NETO, A., SOARES, F. M. C., PITTA, F. & FURLANETTO, K. C. J. J. O. A. 2020. Functional tests for adults with asthma: validity, reliability, minimal detectable change, and feasibility. 1-9.
3. CRIMI, E., SPANEVELLO, A., NERI, M., IND, P. W., ROSSI, G. A. & BRUSASCO, V. 1998. Dissociation between airway inflammation and airway hyperresponsiveness in allergic asthma. American journal of respiratory and critical care medicine, 157, 4-9.
4. FREITAS, P. D., SILVA, A. G., FERREIRA, P. G., DA SILVA, A., SALGE, J. M., CARVALHO-PINTO, R. M., CUKIER, A., BRITO, C. M., MANCINI, M. C. & CARVALHO, C. R. 2018. Exercise improves physical activity and comorbidities in obese adults with asthma. Eur Respiratory Soc.
5. WANG, D. X., YAO, J., ZIREK, Y., REIJNIERSE, E. M. & MAIER, A. B. 2020. Muscle mass, strength, and physical performance predicting activities of daily living: a meta-analysis. Journal of cachexia, sarcopenia and muscle, 11, 3-25.
6. STOFFELS, A., DE BRANDT, J., MEYS, R., VAN HEES, H., VAES, A., KLIJN, P., BURTIN, C., FRANSSEN, F., VAN DEN BORST, B. & SILLEN, M. 2020. Health status in COPD according to short physical performance battery summary score. Eur Respiratory Soc.
7. OLIVEIRA, J. M. D., SPOSITON, T., CERCI NETO, A., SOARES, F. M. C., PITTA, F. & FURLANETTO, K. C. J. J. O. A. 2020. Functional tests for adults with asthma: validity, reliability, minimal detectable change, and feasibility. 1-9.
8. HANADA, M., YAMAUCHI, K., MIYAZAKI, S., OYAMA, Y., YANAGITA, Y., SATO, S., MIYAZAKI, T., NAGAYASU, T. & KOZU, R. 2020. Short-Physical Performance Battery (SPPB) score is associated with postoperative pulmonary complications in elderly patients undergoing lung resection surgery: A prospective multicenter cohort study. Chronic Respiratory Disease, 17, 1479973120961846.
9. FUJITA, K., NAKASHIMA, H., KAKO, M., SHIBATA, A., YU-TING, C., TANAKA, S., NISHIDA, Y., KUZUYA, M. J. A. O. G. & GERIATRICS 2020. Short physical performance battery discriminates clinical outcomes in hospitalized patients aged 75 years and over. 90, 104155.
10. ESSAM BEHIRY, M., MOGAWER, S., YAMANY, A., RAKHA, M., AWAD, R., EMAD, N. & ABDELFATAH, Y. 2019. Ability of the Short Physical Performance Battery Frailty Index to Predict Mortality and Hospital Readmission in Patients with Liver Cirrhosis. International Journal of Hepatology, 2019, 8092865.
11. WENZEL, S., CASTRO, M., CORREN, J., MASPERO, J., WANG, L., ZHANG, B., PIROZZI, G., SUTHERLAND, E. R., EVANS, R. R. & JOISH, V. N. J. T. L. 2016. Dupilumab efficacy and safety in adults with uncontrolled persistent asthma despite use of medium-to-high-dose inhaled corticosteroids plus a long-acting β2 agonist: a randomised double-blind placebo-controlled pivotal phase 2b dose-ranging trial. 388, 31-44.
12. WESTMAN, A. W., COMBS-MILLER, S., MOORE, J., EHRLICH-JONES, L. J. A. O. P. M. & REHABILITATION 2019. Measurement characteristics and clinical utility of the short physical performance battery among community-dwelling older adults. 100, 185-187
13. CRIMI, E., SPANEVELLO, A., NERI, M., IND, P. W., ROSSI, G. A. & BRUSASCO, V. 1998. Dissociation between airway inflammation and airway hyperresponsiveness in allergic asthma. American journal of respiratory and critical care medicine, 157, 4-9.
14. FREITAS, P. D., SILVA, A. G., FERREIRA, P. G., DA SILVA, A., SALGE, J. M., CARVALHO-PINTO, R. M., CUKIER, A., BRITO, C. M., MANCINI, M. C. & CARVALHO, C. R. 2018. Exercise improves physical activity and comorbidities in obese adults with asthma. Eur Respiratory Soc.
15. LARSSON, P., BORGE, C. R., NYGREN-BONNIER, M., LERDAL, A. & EDVARDSEN, A. 2018. An evaluation of the short physical performance battery following pulmonary rehabilitation in patients with chronic obstructive pulmonary disease. BMC Research Notes, 11, 348.
16. OLIVEIRA, J. M. D., SPOSITON, T., CERCI NETO, A., SOARES, F. M. C., PITTA, F. & FURLANETTO, K. C. J. J. O. A. 2020. Functional tests for adults with asthma: validity, reliability, minimal detectable change, and feasibility. 1-9.
17. STOFFELS, A., DE BRANDT, J., MEYS, R., VAN HEES, H., VAES, A., KLIJN, P., BURTIN, C., FRANSSEN, F., VAN DEN BORST, B. & SILLEN, M. 2020. Health status in COPD according to short physical performance battery summary score. Eur Respiratory Soc.
18. WANG, D. X., YAO, J., ZIREK, Y., REIJNIERSE, E. M. & MAIER, A. B. 2020. Muscle mass, strength, and physical performance predicting activities of daily living: a meta-analysis. Journal of cachexia, sarcopenia and muscle, 11, 3-25.