

Rapid Communication

An under studied co-relation of diabetes and lung function

Dona Das*, R. V. Sridhar

Department of Medicine, Shri Sathya Sai Medical College and Research Institute- A constituent of Sri Balaji Vidyapeeth (SBV), Puducherry, Tamil Nadu, India

Received: 26 May 2019

Revised: 17 June 2019

Accepted: 03 July 2019

*Correspondence:

Dr. Dona Das,
E-mail: donad35@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

The World Health Organization estimates that more than 180 million people worldwide have diabetes, and by 2030 it is expected that this number will have doubled. There is an alarming increase in the incidence and prevalence of diabetes mellitus (DM) in Asian Indians. Epidemiology of Diabetes in India. The prevalence of diabetes is rapidly rising all over the globe at an alarming rate. Over the past 30 years, the status of diabetes has changed from being considered as a mild disorder of the elderly to one of the major causes of morbidity and mortality affecting the youth and middle aged people. Pulmonary function test (PFT) is a complete evaluation of the respiratory system including patient history, physical examinations, and tests of pulmonary function. with insulin-dependent diabetes compared with age-matched control subjects, all lifelong non-smokers. Lung CO transfer capacity is significantly affected by the integrity of lung capillary endothelium and, therefore, the findings of Sandler et al. focused attention on pulmonary vascular changes. The concept of the lung as a target organ for diabetic microangiopathy received continuing attention. Reports of lung function tests in patients with diabetes over the next 15 years have focused largely on pulmonary microangiopathy with relatively few studies of pulmonary mechanical function which leads to a restrictive lung pattern. Diabetes and Lung Function Test : Some studies showed that all the pulmonary parameters, that is, FVC, FEV1, FEF25, FEF50, FEF75, FEF25-75, FEF0.2-1.2, and PEFr were significantly reduced except FEV1/FVC in patients of type 2 DM as compared with the healthy controls. It can be concluded from our narrative review that the Type II or Type I diabetes is definitely having decreased lung functions assessed by spirometry not only because of diabetic complications like pneumonia or other but also due to long term effect of diabetes may be because of micro-angiopathy or decreased elastic recoil capacity of lungs.

Keywords: Diabetes, Forced vital capacity, Lung function test, Microangiopathy, Restrictive, Spirometry

INTRODUCTION

The knowledge of Diabetes Mellitus causing a decreased lung function is rarely taken into notice unless a patient becomes symptomatic. Concentration is shown more on the microvascular complications of diabetes such as diabetic retinopathy, diabetic nephropathy and diabetic neuropathy and quite less on diabetic pneumopathy. As the complications of diabetes is increasing at lightening speed, the awareness of the same is not proportional,

especially in the rural parts of India. Recent surveys have shown that diabetes now encompasses a thundering 10-16% of urban community and (5-8%) of rural community in India.^{1,2}

Mohan D et al, in Chennai studied that even the known diabetic subjects, knowledge about diabetes more so involving awareness of complications caused by diabetes was poorer.³ Study conducted by David. A Kaminsky in 2004 shows that an abnormal lung function may precede the diagnosis of diabetes, a indicating that lungs may be

commonly affected by the ongoing pathogenesis of Diabetes.⁴

DISCUSSION

More than a quarter-century ago, Schuyler et al, investigated lung function in 11 young (21-28 years old) patients with type 1 diabetes and age matched normal control subjects. This classic study was the first to report measurements of nearly all the available tests of lung function, including lung elasticity, capacity to transfer carbon monoxide (CO, a surrogate for oxygen transfer capacity), absolute thoracic gas volumes, airflow resistance, and maximal forced spirometric pulmonary function tests (PFTs). As their subjects were lifelong nonsmokers without allergies or lung disease, their finding that lung elastic recoil was decreased in these young patients with diabetes was interpreted to reflect effects of diabetes on lung elastic proteins. This was the first suggestion in the literature that the lung may be a target organ of diabetes.⁵

Subsequent studies demonstrated further evidence of pulmonary micro angiopathy, including thickening in alveolar capillary and pulmonary arteriolar walls in human postmortem studies of patients with diabetes and decreased lung capillary blood volume in patients with type 1 diabetes.⁶ In contrast to the substantial evidence supporting the concept of the lung as a target organ for diabetic micro angiopathy, reports of lung mechanical abnormalities in diabetes have been less convincing. The clinical implications of this is that, pulmonary dysfunction should be regarded as a specific derangement induced by DM. Further studies may clarify whether this should be included as a long-term complication of diabetes. The role of strict glycemic control on pulmonary function in diabetic patients is another interesting aspect and needs further studies. The impairment in PFTs can lower the threshold for clinical manifestations of acute or chronic lung disease. Patients with DM admitted with pneumonia have increased risk of complications and mortality.⁷⁻⁹

CONCLUSION

Awareness of Diabetes must be encouraged on a larger scale to reach masses of both rural and urban population of community. Education on how to maintain a healthy lifestyle is equally important as this also significantly reduces complications of diabetes. Pulmonary Function Tests should be made an easy access for all diabetic patients as including this as a routine procedure at least on OPD basis helps to make an early assessment of

respiratory compromise and further delay complications. Two major national health programs are in gear to train our physicians, viz., Certificate Course in Evidence Based Diabetic Management- CCEBDM and National Diabetic Education Programme (NDEP). Telemedicine intervention from 2012 has opened access for the rural population increasing awareness which is commendable.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

REFERENCES

1. Wild S, Roglic G, Green A, Sicree R, King H. Global prevalence of diabetes: Estimates for the year 2000 and projections for 2030. *Diab Care.* 2004;27:1047-53.
2. Pradeepa R, Mohan V. The changing scenario of the diabetes epidemic: Implications for India. *Indian J Med Res.* 2002;116:121-32.
3. Mohan D, Raj D, Shanthirani CS, Datta M, Unwin NC, Kapur A, et al. Awareness and knowledge of diabetes in Chennai- The Chennai Urban rural Epidemiology study. *J Assoc Physicians India.* 2005;53:283-7.
4. Kaminsky DA. Spirometry and diabetes: Implications of reduced lung function. *Diab Care.* 2004;27:837-8.
5. Schuyler M, Niewoehner D, Inkley S, Kohn R: Abnormal lung elasticity in juvenile diabetes mellitus. *Am Rev Resp Dis.* 1976;113:37-41.
6. Fuso L, Cotroneo P, Basso S, De Rosa M, Manto A, Ghirlanda G, et al. Postural variations of pulmonary diffusing capacity in insulin-dependent diabetes mellitus. *Chest.* 1996;110:1009-13.
7. Davis TM, Knuiman M, Kendall P, Vu H, Davis WA. Reduced pulmonary function and its association in type 2 diabetes: The fremantle diabetes study. *Diabetes Res Clin Pract.* 2000;50:153-9.
8. Engstrom GJ, Janzon L. Risk of developing diabetes is inversely related to lung function: a population based cohort study. *Diab Med.* 2002;19:167-70.
9. Yeh HC, Punjabi NM, Wang NY, Pankow J, Duncan BB, Cox CE, et al. Cross sectional and prospective study of lung function in adults with diabetes mellitus. *Diab.* 2002;51:A242-3.

Cite this article as: Das D, Sridhar RV. An under studied co-relation of diabetes and lung function. *Int J Res Med Sci* 2019;7:3200-1.