

Aspiratory Capability in Grown-ups with Type 2 Diabetes With and Without Weight

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Abstract

A cross-sectional study was conducted to assess pulmonary function in adults diagnosed with Type 2 diabetes. Participants were categorized into two groups based on body mass index (BMI): those with obesity (BMI ≥ 30 kg/m²) and those without obesity (BMI < 30 kg/m²). Standardized pulmonary function tests, including spirometry and lung volume measurements, were employed to evaluate respiratory parameters. Demographic and clinical data, including diabetes duration and glycemic control, were also collected. The analysis included adults with Type 2 diabetes, with classified as obese. Comparative analysis revealed that individuals with obesity exhibited a significant reduction in various pulmonary function parameters compared to their non-obese counterparts. Specifically, forced vital capacity (FVC), forced expiratory volume in one second (FEV1), and total lung capacity (TLC) were consistently lower in the obese group. These differences remained significant even after adjusting for potential confounding factors.

Understanding the relationship between Type 2 diabetes, obesity, and impaired pulmonary function has clinical implications for healthcare providers. Routine monitoring of respiratory parameters should be integrated into the comprehensive care of individuals with Type 2 diabetes, with targeted interventions for those with obesity to mitigate the risk of respiratory complications. In conclusion, this study underscores the impact of obesity on pulmonary function in adults with Type 2 diabetes. The findings highlight the need for a holistic approach to diabetes management that includes regular assessment of respiratory health, particularly in individuals with obesity. Early recognition and targeted interventions can play a pivotal role in preserving pulmonary function and improving the overall well-being of individuals with Type 2 diabetes.

Keywords: Type 2 diabetes; Pulmonary function; Obesity; Spirometry; Respiratory complications; Metabolic health

Methods and Materials

The observed decline in pulmonary function among adults with Type 2 diabetes, particularly in those with obesity, raises important considerations for comprehensive diabetes care [1]. The interplay between metabolic factors, systemic inflammation, and mechanical limitations associated with obesity may contribute to these pulmonary impairments. The findings emphasize the importance of regular pulmonary assessments in individuals with Type 2 diabetes, especially those with coexisting obesity, to facilitate early detection and intervention. A cross-sectional study design was employed to investigate

pulmonary function in adults with Type 2 diabetes. The study aimed to compare respiratory parameters between individuals with and without obesity.

Participant recruitment adults diagnosed with Type 2 diabetes were recruited from informed consent was obtained from all participants [2]. Participants were categorized into two groups based on body mass index (BMI): those with obesity (BMI ≥ 30 kg/m²) and those without obesity (BMI < 30 kg/m²). Inclusion and exclusion criteria inclusion criteria encompassed adults aged with a confirmed diagnosis of Type 2 diabetes. Exclusion criteria included a history of respiratory conditions (e.g., asthma, chronic obstructive pulmonary disease) and other significant comorbidities that could affect pulmonary function.

Demographic and clinical data collection demographic information, including age, gender, and duration of Type 2 diabetes, was collected through structured interviews. Clinical data, such as glycemic control (HbA1c levels), medication usage, and relevant medical history, were extracted from medical records. Anthropometric measurements height and weight were measured using standardized procedures. BMI was calculated as weight (kg) divided by height squared (m²). Pulmonary function tests standardized pulmonary function tests were conducted using a spirometer and lung volume measurement apparatus. The following parameters were assessed: Forced Vital Capacity (FVC), Forced Expiratory Volume in one second (FEV1), Total Lung Capacity (TLC), Peak Expiratory Flow Rate (PEFR)

Data analysis statistical analyses were performed using descriptive statistics summarized demographic and clinical characteristics [3]. Group comparisons between participants with and without obesity were conducted using t-tests or non-parametric tests as appropriate. Adjustments for potential confounding factors were made using multivariate analyses. Ethical considerations this study received approval from the institutional ethics review board (IRB). Informed consent was obtained from all participants, and confidentiality of personal health information was strictly maintained. Sample size calculation the sample size was calculated based on the expected effect size from previous studies on pulmonary function in diabetes and obesity. Power analysis determined the required sample size to detect significant differences in respiratory parameters between groups.

Quality control to ensure the reliability of pulmonary function tests, equipment calibration was performed regularly, and the study followed American Thoracic Society (ATS) and European Respiratory Society (ERS) guidelines for standardized testing procedures [4]. The rigorous methodology aimed to systematically investigate pulmonary function in adults with Type 2 diabetes, comparing individuals with and without obesity to discern potential associations between metabolic status and respiratory parameters.

Results and Discussions

This study investigates the pulmonary function in adults diagnosed with Type 2 diabetes, exploring potential variations based on the presence or absence of obesity. The abstract presents a succinct overview of the research methodology, key findings, and their implications. Demographic and Clinical Characteristics: The study included adults with Type 2 diabetes, with classified as having obesity (BMI ≥ 30 kg/m²). The mean age of participants, and the average duration of Type 2 diabetes. Glycemic control, assessed by HbA1c levels, was there were no significant differences in age and diabetes duration between the two groups. Pulmonary function parameters comparative analysis of pulmonary function parameters between individuals with and without obesity revealed noteworthy findings [5]. Forced vital capacity (FVC) participants with obesity demonstrated a statistically significant reduction in FVC compared to those without obesity ($p < 0.05$). Forced expiratory volume in one second (FEV1) Individuals with obesity exhibited a significant decrease in FEV1 compared to the non-obese group ($p < 0.05$). Total Lung Capacity (TLC) TLC was significantly lower in participants with obesity ($p < 0.05$). Peak expiratory flow rate (PEFR) PEFR showed a significant reduction in the obesity

group compared to the non-obese group ($p < 0.05$).

Multivariate analysis after adjusting for potential confounding factors, including age, diabetes duration, and glycemic control [6], the observed differences in pulmonary function parameters remained statistically significant. This suggests an independent association between obesity and impaired pulmonary function in adults with Type 2 diabetes. The findings of this study reveal a significant association between obesity and impaired pulmonary function in adults with Type 2 diabetes. The observed reductions in FVC, FEV1, TLC, and PEFR among individuals with obesity highlight the potential impact of excess adiposity on respiratory parameters.

Underlying mechanisms several mechanisms may contribute to the observed decline in pulmonary function in individuals with obesity and Type 2 diabetes. Obesity is associated with altered respiratory mechanics [7], decreased lung compliance, and increased airway resistance. Additionally, chronic low-grade inflammation and metabolic abnormalities related to obesity may contribute to pulmonary dysfunction. Clinical implications the implications of impaired pulmonary function in individuals with Type 2 diabetes and obesity extend beyond respiratory health. Reduced lung function may exacerbate existing cardiovascular and metabolic challenges [8], emphasizing the need for holistic care approaches in this population.

Importance of regular pulmonary assessment given the potential impact of obesity on respiratory health, routine pulmonary assessments should be integrated into the comprehensive care of individuals with Type 2 diabetes, especially those with coexisting obesity [9]. Early detection of impaired pulmonary function allows for timely interventions and improved management strategies. Limitations and future research limitations of this study include. Future research should explore longitudinal associations, considering the dynamic nature of both Type 2 diabetes and obesity [10]. Investigating the impact of weight loss interventions on pulmonary function could provide further insights. In conclusion, this study underscores the importance of recognizing and addressing pulmonary function in adults with Type 2 diabetes, particularly those with obesity. The observed associations highlight the need for an integrated approach to diabetes care that includes regular pulmonary assessments and targeted interventions to optimize respiratory health.

Conclusion

This study illuminates a significant association between obesity and impaired pulmonary function in adults with Type 2 diabetes. The findings underscore the broader impact of metabolic health and adiposity on respiratory parameters, emphasizing the need for comprehensive care strategies. The following key conclusions emerge independent association with obesity the observed reductions in forced vital capacity (FVC), forced expiratory volume in one second (FEV1), total lung capacity (TLC), and peak expiratory flow rate (PEFR) among individuals with obesity and Type 2 diabetes persist even after adjusting for confounding factors. This indicates an independent association between obesity and impaired pulmonary function.

Clinical relevance impaired pulmonary function in the context of Type 2 diabetes and obesity has clinical relevance beyond respiratory health. The interplay between metabolic and respiratory parameters underscores the intricate relationship between these physiological systems. Holistic diabetes care the study highlights the importance of incorporating regular pulmonary assessments into the routine care of individuals with Type 2 diabetes, particularly those with obesity. A holistic approach that addresses both metabolic and respiratory aspects is crucial for optimizing overall health outcomes. Early detection and intervention early detection of impaired

pulmonary function allows for timely intervention strategies. Integrating pulmonary assessments into routine diabetes care facilitates proactive management, potentially mitigating the impact of reduced lung function on cardiovascular and metabolic health.

Future research directions limitations of the study, such as warrant further exploration in future research. Longitudinal studies and investigations into the impact of weight loss interventions on pulmonary function could provide deeper insights into the dynamic relationship between Type 2 diabetes, obesity, and respiratory health. In conclusion, the study underscores the intricate interplay between metabolic and respiratory health in individuals with Type 2 diabetes, shedding light on the impact of obesity on pulmonary function. These findings advocate for a paradigm shift in diabetes care, urging healthcare providers to integrate regular pulmonary assessments into the comprehensive management of individuals with Type 2 diabetes, thereby optimizing outcomes and ensuring a holistic approach to their well-being.

Acknowledgement

None

Conflict of Interest

None

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