



GERIATRIC LUNG

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ABSTRACT**Introduction**

What is aging? It's refers to impaired ability to maintain homeostasis in face of external and internal challenges or stresses. It's a driving force of development & increasing the burden of non communicable diseases. Present study focused on lung function test only.

Methods & Material: 200 elderly males were selected for the study

Inclusion: 200 male subjects (Study group) aged group 55-65yrs & 66-80yrs

Exclusion: Smokers, Nicotine chewers, Hypertension, Type 2 Diabetes, Tuberculosis, Pneumonia, kyphosis and any other upper or lower airway infections.

Control group: 100 adult males age group (28-35yrs)

Spirometer (Spiroexcel) Medicaid system was used: Pulmonary function test

Statistical analysis: SSPE version 19

Results: Decline % of FEV, FEV1, FVC, FEV1/FVC, PEFR and MVV in study group compared to that of control

Conclusion: Reduction in % Pulmonary function tests along with reduced cough strength.

KEYWORDS :**INTRODUCTION**

Although the prevalence of lung diseases has been increasing as population ages, it still underestimated in older persons²⁻⁵. Age is a risk factor for pneumonia, regardless of whether patients are home dwelling or institutionalised⁶⁻⁹.

Epidemiology

India, the world's second most populous country, has experienced a dramatic demographic transition in the past 50 years, entailing almost a tripling of the population over the age of 60 years¹⁰

This pattern is poised to continue. It is projected that the proportion of Indians aged 60 and older will rise from 7.5% in 2010 to 11.1% in 2025 United Nations Department of Economic and Social Affairs. This is a small percentage point increase. UNDESA data on projected age structure of the population¹¹

India had more than 91.6 million elderly in 2010 with an annual addition of 2.5 million elderly between 2005 and 2010. The number of elderly in India is projected to reach 158.7 million in 2025¹¹ and is expected, by 2050 to surpass the population of children below 14 years.¹²

While the southern states Andhra Pradesh, Karnataka, Kerala, and Tamilnadu may be considered the biggest drivers of aging in India, other states notably Haryana, Himachal Pradesh, Maharashtra, Orissa, and Punjab are also experiencing an elderly population boom largely in rural areas.¹³

To this end, methodological contributions from ongoing cohort studies such as the Longitudinal Study on Aging in India (LASI) and parallel efforts internationally will be highly valuable. Among the most significant findings that emerged in developing this review was the incompleteness of data on the burdens of access and affordability among elderly populations in India.

A major reason for this routine health data collection in India is not designed to reflect or characterize pathological progression: a process wherein, by virtue of being alive longer than others, the elderly are more likely to experience a pathology, leading to impairment, functional limitations and ultimately disability.

Many routine data collection procedures National Sample Surveys,

Census data, or death certificates in India do not capture pathological progression nor do they disaggregate morbidity and disability outcomes among the elderly¹³⁻¹⁴

Results:**Table No:1 Mean and SD Pulmonary function test**

Variables	Age: 55-65yrs.		Age: 66-80yrs	
	Mean	SD	Mean	SD
FVC (L/min)	3.15	0.85	3.02	1.04
FEV1 (L/min)	2.98	0.76	2.66	0.77
FEV1/FVC (L/min)	80.58	6.02	75.16	4.89
PEFR (L/min)	7.11	1.15	7.66	1.33
MVV (L/min)	139.11	2.59	105.06	4.49

DISCUSSION:**The Ageing Lung**

Structural changes of ageing lung categories:

1. Change in lung structure - chest wall & respiratory muscles¹⁵.

2. Changes in structures mainly attributed to increase in the size of alveolar space without any inflammation or alveolar wall destruction so called "senile emphysema". This might be the consequences of loss of supporting structure of lung parenchyma.¹⁶⁻¹⁸

3. Elastic recoil of lung reduces with increase in age

This phenomenon is caused by reduced surface tension forces from the alveoli due to increased individual diameter size than changes in elastin & collagen in lung parenchyma.¹⁵

Consequences of ageing on lung:

a. Compliance decreases progressively

b. Shape of thorax may change due to age related osteoporosis

c. Stiffness of ribs further enhancing the forces needed for movement of chest.

d. Loss of strength of muscle is diaphragm reflected on breathing

pattern 15,19

e. Natural defence mechanism of lungs also gradually become less functional, leading to increased infection risk, muco-ciliary clearance is known to be compromised with age²⁰.

f. Accumulation deteriorates in aging lung, further more the intercellular communication becomes less effective with aging, contributing to phenomena called IMMUNOSENESCENCE and INFLAMMAGING.²¹⁻²²

Pulmonary function test on ageing:

FEV1 (Forced expiratory volume 1sec) , FVC (Forced vital capacity) decline with age, higher in males compared to females. As a consequence of reduced elastic recoil and compliance chest wall, the residual volume increases, while vital capacity decreases. But the TLC (Total lung capacity) doesn't change with age, because the reduction of elastic recoil observed upon ageing is counterbalanced by decrease in chest wall compliance & muscle strength of the chest.^{15,19}

HALLMARKS OF AGEING

Lopez-Otin²² et al proposed 9 hallmark of aging ie

1. GENOMIC INSTABILITY
2. TELEOMER ATTRITION
3. EPIGENETICS ALTERATION
4. LOSS OF PROTEOSTASIS
5. Deregulated NUTRIENT-SENSING
6. MITOCHONDRIAL DYSFUNCTION
7. CELLULAR SENESCENCE
8. STEM CELL EXHAUSTION
9. ALTERED INTERCELLULAR COMMUNICATION

Future research needed:

- Longitudinal and more complete studies on effects of aging on pulmonary systems
- Educating about lung structures-function relationships in older population group
- Identify natural age related changes of airway
- Identify ENVIRONMENTAL FACTORS augmenting the PREVALENCE of age-related cellular changes and differentiating between COPD & Asthma & Allergy
- Future studies on molecular mechanisms of aging like epigenetics and genetics & providing intervention to improve human health.

Limitation of study

1. Couldn't measure the Muscle function on a cellular level
2. Due to Cost-effective DLCO measurement wasn't possible
3. Immunological tests like measurement IL-6, TNF- α & Lact but not least patient CO-OPERATION was much needed.

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