

Cadaveric Length of Trachea in Bangladeshi Adult Male

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Abstract

Context: Anatomical knowledge about length of trachea is essential for anesthetists, surgeons, radiologists & sonologists. In anesthetic procedure, the knowledge of the length of trachea helps to select correct sizes of endotracheal tubes.

Study Design: A descriptive type of study.

Place and period of study: The study was carried out in the Department of Anatomy, Sir Salimullah Medical College, Dhaka, from July 2006 to June 2007.

Materials: 47 trachea of Bangladeshi adult male, age ranged from 20 to 58 years within 24 hours after death which were autopsied in the Department of Forensic Medicine of Sir Salimullah Medical College & Dhaka Medical College, Dhaka.

Method: The collected samples were divided into four age groups, ranged from 20 to 58 years and comparative studies were done between different age groups.

Result: The length of trachea increased with advancing age. The values showed positive correlation with age & statistically was highly significant ($P < 0.001$).

Conclusion: In the present study the length of the trachea increased with the increasing age. Further study with large sample size is required to make standard data for Bangladeshi adult male.

Key words: Trachea, Length.

Introduction:

The trachea, a tube of cartilage and fibromuscular membrane, about 10-11 cm long & extends from the sixth cervical vertebra to the upper border of fifth thoracic vertebra¹. The length varies with age². It splits into right & left main stem bronchi which enter the respective lungs & progressively branch off throughout the entire organ, the tracheo bronchial tree³.

The tracheo bronchial tree is the essential part of respiratory tract. It serves as a tubular system for conducting air into & out of the alveoli of lung. In addition, it participates in humidification, temperature adjustment & elimination of air born pollutants of inspired air⁴. Anatomical knowledge about the length of trachea is essential for anaesthetists for selecting anatomically designed cuff for endotracheal intubation⁵.

The present study was planned to establish our standard data and to compare the data with that of other countries.

Materials and Methods:

47 trachea of Bangladeshi adult male of different ages were selected for the present study. The samples were collected from unclaimed dead bodies autopsied in the Department of Forensic Medicine of Sir Salimullah Medical College & Dhaka Medical College within 12 to 36 hours of death. World Health Organization (WHO) defined an

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adolescent as a person between 10 & 19 years of age. The present study was planned to collect samples from Bangladeshi adult male. So, the samples were collected from male 20 & above 20 years of age.

The samples were washed gently & thoroughly with running tap water & tagged properly bearing an identification number & age of the cadaver. Then these were kept in 10% formol saline solution for fixation & preservation. The formol fixed sample was washed properly & a careful dissection was done to expose the desired structures.

Grouping of the samples:

The samples were divided into four age groups; Group A (20-29 years), Group B (30-39 years), Group C (40-49 years) and Group D (50-59 years). [Table-I].

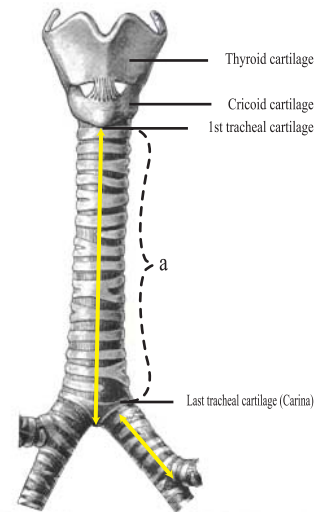


Fig.-1: Part of larynx, trachea and primary bronchi, showing the Measurement of the length of trachea

Table-I
Age distribution in different study groups

Study groups	Age range (in years)	No. of samples (n = 47)
A	20-29	16
B	30-39	16
C	40-49	08
D	50-59	07

Procedure of the study:

Measurement of length of trachea:

The length of trachea was measured in cm by a measuring tape from the lower border of cricoid cartilage to the lower border of carina in midline⁶. (Fig-1).

Observation and Result:

In the study, the mean lengths of the trachea were 8.73 ± 0.21 cm in Group A, 9.53 ± 0.46 cm in Group B, 9.63 ± 0.23 cm in Group C & 9.79 ± 0.39 cm in Group D. (Table-II & Fig-2).

Statistical analysis showed positive correlation (r = +0.759) between age & length of trachea & it was highly significant (P<0.001). (Fig-3).

Table-II
Length of trachea in different study groups

Groups	n	Length in cm Mean±SD
A	16	8.73±0.21 (8.50-9.10)
B	16	9.53±0.46 (9.00-10.50)
C	8	9.63±0.23 (9.50-10.00)
D	7	9.79±0.39 (9.50-10.50)

Groups	P value
A vs B	< 0.001***
A vs C	< 0.001***
A vs D	< 0.001***
B vs C	> 0.50ns
B vs D	> 0.10ns
C vs D	> 0.10ns
Group A	: Age 20-29 years
Group B	: Age 30-39 years
Group C	: Age 40-49 years
Group D	: Age 50-59 years

Figures in parentheses indicate range. Statistical analysis was done by ANOVA (multiple comparison), ns = not significant, *** = significant

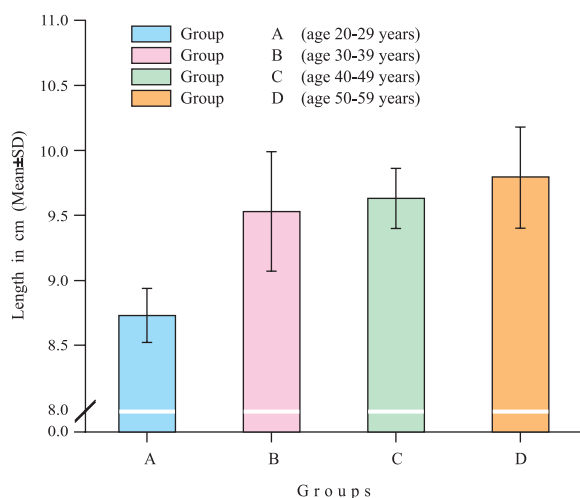


Fig.-2: Length of trachea in different study groups

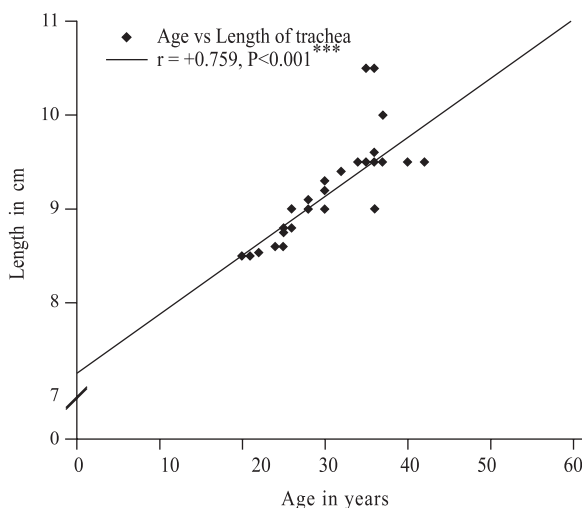


Fig.-3: Relationship between age and length of trachea

Discussion:

The present work was carried out on 47 trachea of autopsied Bangladeshi adult male. The result showed similarity as well as dissimilarity with other studies. The values were lower than those described by different western authors e.g. Shah (2005)¹, Snell (2004)⁷, Allen (2003)², Thibodean & Patton (2003)⁸, Sinnatamby (1999)⁹ and Ellis & Feldman (1993)¹⁰. The racial and fixation factors may be responsible for the lower values of the present study. The findings were similar with that of Harjeet & Indarjit (2000)¹¹. The values were higher than those were reported by Narayan (2005)¹² and Yousuf (1996)¹³. Their study

included some adolescents which acted as the lowering effect of their values.

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