

Morphometric study of fallopian tube and its relation with age and height of the individual in south Indian population

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Abstract

Introduction: The necessity of identification of an individual is paramount important from birth to death as flawed identity can lead to several medico-legal complications. Age and stature of an individual are significant criterion in personal identification. There are age associated variations of the fallopian tube like the length of the fallopian tube increases from pre-reproductive to reproductive age group then it progressively decreases in postmenopausal period.

Aim: The aim of this study is to measure length of fallopian tubes and to correlate that with the age and stature of the individual.

Materials and Methods: This was a prospective study conducted on dead bodies of 46 females that were autopsied in the mortuary of Forensic Medicine department, Kasturba Medical College, Manipal. The length of both right and left side fallopian tube were measured using measuring tape. Stature was measured using graduated autopsy scale. The age of the deceased was noted down from the autopsy files. The result was analyzed using SPSS software.

Results: The mean lengths of right & left fallopian tubes were 4.86 ± 1.91 cms and 5.06 ± 1.94 cms respectively. There was significant correlation of both age and stature with the lengths of fallopian tubes on either side.

Conclusion: The result of this study will help the Forensic Pathologist to find the age as well as stature of individual from fallopian tube. Precise information of the normal length of the fallopian tube may aid the gynecologists to adopt suitable diagnosis and management of numerous disorders related with it.

Keywords: Age, fallopian tube, length, forensic experts, stature.

Introduction

Identification of a person from mutilated, disfigured and fragmentary remnants is a test to forensic experts therefore in such cases whole identification turn out to be very problematic and inadequate identification needs additional inquiries. The problem arise during mass calamities, explosions, and assault cases where the dead body is disfigured to hide the identity of the victim.¹

The fallopian tubes are a pair of tubes which connect the ovaries with the uterus, through the utero-tubal orifice. The fallopian tube act as a passage for the germ cells in two directions and zygote towards the uterus.²

Fallopian tubes is very important for fertility and it is most commonly involved in cases of human infertility. Proper fallopian tube function is very significant to provide correct environment for the initial stages of embryo.³ Because of the progress of in-vitro fertilization, it was clear that exposure to the tubal environment is not important for fertilization to take place. Therefore, the importance of fallopian tube is reduced and it is believed nowadays just as a passage for the germ cells and zygote. But, if we look into in vivo fertilization, the fallopian tube will be seen playing a very essential part in transporting gamete, fertilization

and in the early growth of the embryo. Even now a days it is assumed that the mechanism of tubal transport is very complex and it can be involved in various diseases and conditions that decrease fertility.⁴

Many studies have shown that from all the mathematical methods which are used, regression formulae are the more accurate one which give precise results. Different factors affect the growth and development of individual. So, the formula which is designed to find the stature of one population may not apply for other populations. So, it is necessary to derive different regression formulae to determine the stature from various parts of the body in different population groups as they differ from population to population.⁵

Stature is anatomically very intricate and it includes the measurements of legs, pelvis, vertebral column and skull and the role of each one of them total differs from one individuals to other and it also differs in different populations. Therefore, at the time of the study of human remnants, forensic anthropologists should have the required knowledge of human differences which exist in different region and different population in order to identify any unidentified individual. So, it is important for all researcher to carry out research on various population groups living in diverse geographic regions to give an up to date information regarding these matters.⁶

There are very limited studies done on fallopian tube on this matter. So the present study is done to measure length of fallopian tube and to correlate it with the height and age of the individual.

The result of this study may be useful for forensic pathologist to find the age as well as the stature of a female from the fragmentary remnants of pelvis. Information about the normal dimensions will also help the gynecologists in identifying and handling various disease condition related to the fallopian tube.

Materials and Methods

The present study was carried on 46 females who were autopsied at Mortuary of Forensic Medicine & Toxicology department. The cases under study were

allocated into three age groups, Pre pubertal (Group A: 0-13yrs), Reproductive (Group B: 14-45 yrs) and Post-menopausal (Group C: >45 yrs). Institutional Ethics committee clearance was obtained before starting the study.

The length of both right and left side fallopian tubes were measured using measuring tape. The height of the female (Stature) was measured using the graduated autopsy scale measuring from the vertex to the heel. The age of the deceased was noted down from the autopsy files.

The data collected were processed to get mean values, standard deviation (SD) and appropriate statistical analyses were done through T-test. Linear regression equations were derived using Spss16 software to find height using fallopian tube length.

Table 1: Showing Mean and range of various measurements done on fallopian tube

Parameter		Mean (cm)	Range	
Fallopian tube	Right	0-13yrs (A)	3.25	3-3.5
		14-45yrs (B)	4.96	3-11
		>45yrs (C)	5.09	2.5-8
	Left	0-13yrs (A)	3	3-3
		14-45yrs (B)	5.11	2.5-10.5
		>45yrs (C)	5.24	3-9
Height		153.71	110-174	
Age		36.82	6-88	

Results

The mean and range of all parameters of both fallopian tubes, height and age are shown in Table 1. The mean total lengths of right & left fallopian tubes were 4.86 ± 1.91 cms and 5.06 ± 1.94 cms respectively.

By applying T- test it is found that the length of fallopian tube on both right and left side was significantly related with the age of an individual. Similarly we also found that length of fallopian tube on both right and left side was significantly related with the height of an individual. But it was seen that length of right and left fallopian tube was not related to each other as P value came out to be 0.06.

Regression equations of finding stature from right and left fallopian tube dimensions are-

Right fallopian tube: $Y = 148.63 + 1.04 X$ (RL)

Left fallopian tube: $Y = 146.48 + 1.42 X$ (LL)

Discussion

Stature is the normal height of a person in upright position. It depends on many factors like genetic and environmental factors etc. Stature assessment is very important in medico-legal cases where identifying the victim from the given body parts becomes very difficult. It is also very important when the stature cannot be determined in deceased due to various body malformations like kyphosis and scoliosis etc.⁷

Now a days there is occurrence of many number of mass catastrophes which involves bomb explosion, plane crash and suicide bombs where the bodies of victims becomes severely damaged and it's difficult to identify them. In such conditions just a part of body part may be available for the forensic experts to find the stature of the person e.g. pelvis, hand and foot etc.^[8] so, in these conditions such types of studies becomes very helpful to find the stature.

Talukdar H found in his study the total mean length of the both side fallopian tube including in all age groups was 9.29 cm while in the present study the total mean length was 4.46cm. They also found that in all age group the left side length of fallopian tube length was more as compared to right side. While in the present study it was found that left side value was higher in reproductive and post reproductive age group. Whereas in pre reproductive age right side length of fallopian tube was higher as compared to left side. In their study they found the mean length of fallopian tube was highest in the reproductive age group and that also on the left side (10.5cm) and lowest in the pre reproductive age group and that was on the right side (7.65cm). Whereas in the present study we got the highest and lowest mean value in the post reproductive group and pre reproductive age group but both were on the left side (5.24, 3.00cm respectively).²

Hwang TS found that uterine tube length did not show statistically significant differences in relation to

age. But in our study there was significant correlation of age with the length of fallopian tube on both right and left side as P value was 0.000.⁹

Presently there is very limited amount of research done on this topic. So, this study will be very helpful for the gynecologists and forensic experts. The present study has highlighted the dimensions of the fallopian tube in various age groups. And it is observed that the dimensions of the fallopian tube is not identical on both sides of the same person. We have also found the regression equation which will help the Forensic pathologist to find the age as well as the stature of the individual from this organ.

Precise knowledge of the normal morphometry of the fallopian tube will also assist the gynecologists and endocrinologists to adopt correct diagnosis and management of several clinical disorders related with the fallopian tube.

Conclusion

In our study we found that there was significant correlation of age with the length of fallopian tube on both side. Even we also got that stature of a person is significantly related with the length of fallopian tube on both side. This signifies that we can easily find the height and age of a female if we know the length of fallopian tube. We have also found the regression equation which no one has done till now by which we can easily find the stature and age of a person if we know the length of fallopian tube in south Indian population. So, this study will be useful in cases of mass disaster (wars, accidents, terror events and natural disasters), where correct stature estimation is vital for identification of the victims.

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