Original Article

Age related change of total length of fallopian tubes in Bangladeshi female cadaver

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ABSTRACT

Context: Human life begins in the fallopian tube. It receives the oocyte from the ovary and fertilization take place here. It provides nourishment for the fertilized ovum and transports it to the uterus. So the Fallopian tube is one of the vital organs for human fertility. In treatment of infertility (in ART) and in the management of ectopic (tubal) pregnancies, the knowledge of the anatomy of the fallopian tube is necessary. Study Design: Descriptive type of study. Place & period of study: Department of Anatomy, Dhaka Medical College, Dhaka from July 2008 to June 2009. Materials: 120 postmortem human fallopian tubes were collected from 60 unclaimed dead bodies that were under examination in the morgue of Department of Forensic Medicine, Dhaka Medical College, Dhaka. Methods: The samples were divided into three age groups: Group-A (10-13 years), Group-B (14-45 years) and Group-C (46-50 years). Results: In the present study, the mean (± SD) total length of the right and left Fallopian tubes were 9.60 ± 0.55 cm & 9.28 ± 0.48 cm in group A, 11.54 ± 0.80 cm & 11.28 ± 0.71 cm in Group B and 9.25 ± 0.26 cm & 9.10 ± 0.31 cm in Group C respectively. There was no significant difference between the mean length of right and left Fallopian tubes. The highest mean length was found in group B and lowest mean length was in group C. The difference in mean length of the Fallopian tube between Group A & Group B and Group B & Group C were statically significant (P < 0.001). Conclusion: In this study, it was observed that there was significant change in length of fallopian tubes in relation to age.

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Introduction

The fallopian tubes are paired 10cm long and lies on each side of the uterus in the upper free margin of the broad ligaments\(^1\). The tube consists of four main parts. They are from medial to lateral- intramural, isthmus, ampulla and infundibulum\(^2\). Four distinct segments of the uterine tubes can be identified depending on the anatomical position, thickness of the smooth muscle, complexity of the mucosal folding and cellular composition of the mucosa\(^3\).

The uterine tubes are relatively short and wide until puberty\(^4\). After the menopause or following oophorectomy, the uterine tubes gradually involute\(^5\), or atrophied due to lack of oestrogen produced by the ovaries\(^5,6\). Before puberty and after menopause, the tube is functionally quiet\(^7\).

The fallopian tube is the site of two of the most frequent medical problems affecting female infertility and ectopic pregnancy. Tubal disease is usually defined as tubal damage is accountable for 30-40% of cases of female infertility\(^2,6\). In those areas where tubal infection is common, the incidence of ectopic pregnancy is high. The delay in ovum transport is the cause of tubal pregnancy which may result from decreased tubal motility or distorted tubal

<table>
<thead>
<tr>
<th>Group</th>
<th>Age limit in years</th>
<th>Number of samples(120)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Right</td>
</tr>
<tr>
<td>A</td>
<td>10-13 years</td>
<td>5</td>
</tr>
<tr>
<td>B</td>
<td>14-45 years</td>
<td>45</td>
</tr>
<tr>
<td>C</td>
<td>46-50 years</td>
<td>10</td>
</tr>
</tbody>
</table>

Parameter studied

Total length of the fallopian tubes Procedure for measurement of the total length of the fallopian tube anatomy\(^8,9\). A clear conception on the anatomy of the fallopian tubes is a prerequisite for diagnosis and the treatment of the disease of fallopian tube.

Materials and methods

The samples of human Fallopian tubes were collected from the unclaimed female dead bodies that were under examination in the morgue of Department of Forensic Medicine, Dhaka Medical College, Dhaka from November 2008 to June 2009. After legal formalities, the samples were collected within 24-36 hours of death without any sign of putrefaction. All the samples were collected from medicolegal cases. During collection, appropriate age and the cause of death were noted from the morgue’s record book. The samples were brought to the Department of Anatomy, Dhaka Medical College, Dhaka. The samples were tagged immediately, which was bearing a code number for subsequent identification. Soon after collection, each sample was gently washed with tap water on a dissection tray. Blood and blood clots were removed as far as possible. Then the sample was fixed in 10% formol saline solution. The collected samples were divided into three groups\(^7\).

(i) Measurement of the length of the infundibulum, ampulla and isthmus of the Fallopian tube: The Fallopian tubes were cut at the point of their entry into the uterus and put into a tray. The length of the infundibulum, ampulla and isthmus of the Fallopian tube were measured by using a thread (Fig.1) and the thread was imposed on a metallic measuring scale.

![Photograph of measurement of the isthmus, ampulla and infundibulum of the Fallopian tube (1.Isthmus, 2.Ampulla, 3. Infundibulum, 4.fimbriae).](image)
(ii) **Measurement of the length of the intramural part of the Fallopian tube:**

The uterus was cut longitudinally to open the uterine cavity. A pin was introduced through the uterine opening of the Fallopian tube such in a way that the other end came out traversing the whole wall thickness of the uterus. A marking was given on the pin and then imposed on a metallic measuring scale to get the length of the intramural part of the tube (Fig. 2, 3). Then the values of the length of the different parts of the tube were summated to get the total length of the tube.

![Image](57x396 to 267x542)

**Fig. 2** Photograph of measurement of the length of the intramural part of Fallopian tube (a pin is inserted through the uterine ostium).

![Image](57x196 to 294x338)

**Fig. 3** Photograph of measurement of the length of the intramural part of Fallopian tube (the red marked area of the pin indicates the length).

**Results**

In the present study the mean ± SD total length of the right and left Fallopian tubes were 9.60 ± 0.55 cm and 9.28 ± 0.48 cm in group-A, 11.54 ± 0.80 cm and 11.28 ± 0.71 cm in Group-B, and 9.25 ± 0.26 cm and 9.10 ± 0.31 cm in Group-C, respectively. There was no significant difference between the mean length of right and left Fallopian tubes.

The highest mean length was found in group B and lowest mean length was in group C.

The difference in mean length of the Fallopian tube between Group-A & Group-B and Group-B & Group-C were statically significant (P < 0.001) (Table:2 Fig: 4).

**Table 2** Total length of right and left Fallopian tubes in different age group

<table>
<thead>
<tr>
<th>Age group</th>
<th>Total length (cm)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Right Mean±SD</td>
<td>Left Mean±SD</td>
</tr>
<tr>
<td>A</td>
<td>9.60±0.55</td>
<td>9.28±0.48</td>
</tr>
<tr>
<td>(n=5)</td>
<td>(9.00-10.00)</td>
<td>(8.60-9.80)</td>
</tr>
<tr>
<td>B</td>
<td>11.54±0.80</td>
<td>11.28±0.71</td>
</tr>
<tr>
<td>(n=45)</td>
<td>(9.00-13.00)</td>
<td>(9.06-12.80)</td>
</tr>
<tr>
<td>C</td>
<td>9.25±0.26</td>
<td>9.10±0.31</td>
</tr>
<tr>
<td>(n=10)</td>
<td>(9.00-9.50)</td>
<td>(8.65-9.50)</td>
</tr>
</tbody>
</table>

P value

A vs B <0.001***
A vs C >0.10**
B vs C <0.001***

Figures in parentheses indicate range. Comparison between right and left side done by unpaired Student's 't' test and comparison between age group done by One-way ANOVA (PostHoc). ns = not significant. *** = significant.

- **Group A**: Age 10-13 years
- **Group B**: Age 14-45 years
- **Group C**: Age 46-50 years
Fig. 4 Total length of right and left Fallopian tubes in different age groups

Discussion

In the present study, the highest mean ± SD total length of the Fallopian tube was 11.54 ± 0.80 cm in reproductive age group. According to Rosai, Datta, Thomas, Bhatia, Sinnatamby, the total length of the Fallopian tube of adult is 11-12 cm which is similar to the findings of Group B of the present study. Thomas also stated that until puberty the uterine tubes are relatively short which corresponds with the findings of pre-pubertal Group in present study. Hamilton stated that after menopause the uterine tubes gradually involute which corresponds with the findings of the post menopausal Group in present study.

DeCherney stated the length of the adult Fallopian tube ranges from 7-14 cm which is dissimilar with the present study. It may be due to different races and geographic conditions from where the data came.

Rahman stated that the mean ± SD the total length of Fallopian tube in Group A (08-12 year) was 9.65 ± 1.11 cm, in group B (13-25 year) 10.58 ± 1.30 cm, in group C (26-45 year) 10.21 ± 1.05 cm and group D (46-65 year) 10.15 ± 1.71 cm. In present study the mean ± SD total length of fallopian tube in group A (10-13 year) was 9.60 ± 0.55 cm, in group B (14-45 year) 11.54 ± 0.80 cm, and in group C (46-50 year) 9.10 ± 0.31 cm. So the present study findings corresponds with Rahman.

References