

## Opportunistic Salpingectomy: Current Practice in Hospital Setting in Bangladesh

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### Abstract

**Background:** The fimbrial end of the fallopian tube has recently been suggested as the site of origin for epithelial ovarian cancers (EOC). Therefore, a change in practice with opportunistic salpingectomy (OS) at the time of hysterectomy has been advocated for prevention of ovarian cancer in a low-risk population. **Objective:** The aim of this study was to analyze the current trend of performing opportunistic salpingectomy during gynaecological surgery for benign indications in a tertiary care hospital of Bangladesh. **Materials and method:** This retrospective observational study was conducted in the Department of Obstetrics & Gynaecology, BIRDEM Women and Children Hospital, Dhaka, Bangladesh from October 2019 to March 2022. All relevant demographic and clinical information of 255 patients undergoing hysterectomy for benign gynaecological disease without involving the ovaries or adnexae were documented from hospital records after exclusion of patients with any gynecologic cancer or having any ovarian or adnexal pathology, and those who underwent hysterectomy due to pregnancy related conditions. **Results:** Mean age of the patients was  $48.71 \pm 8.31$  years and the highest proportion of patients (49.0%) were in the 41-50 years of age group. Bilateral salpingo-oophorectomy was done in 131 cases (51.4%) with mean age of  $51.95 \pm 7.99$  years and opportunistic salpingectomy was done in 72 cases (28.2%) with mean age of  $42.68 \pm 3.97$  years. The rate of opportunistic salpingectomy statistically increased from 17.39% in 2019 to 36.17% in 2022. **Conclusion:** As seen throughout the world, the practice of opportunistic salpingectomy for prevention of ovarian cancer has also increased in Bangladesh in recent years.

**Keywords:** Opportunistic salpingectomy; Current trend.

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### Introduction

Hysterectomy is the most common major surgery among nonpregnant women throughout the world and there had been a trend of prophylactic bilateral salpingo-oophorectomy (BSO) during hysterectomy due to benign cause previously to

prevent ovarian cancer.<sup>1,2</sup> In a population based study of the United States, it was seen that BSO was done in 54% for all hysterectomies from 2000–2004.<sup>2</sup> But oophorectomy before menopause leads to an abrupt reduction in

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endogenous estrogen and androgen production and is associated with increased all cause mortality, primarily from coronary heart disease and lung cancer, despite reduced rates of ovarian cancer. Therefore, current guidelines advise against prophylactic bilateral salpingo-oophorectomy in premenopausal women.<sup>1,3</sup>

A paradigm shift of the origin of ovarian cancer to fallopian tube has brought more focus on bilateral salpingectomy as a preventive method for ovarian cancer.<sup>4</sup> The most common histology of Epithelial ovarian cancer (EOC), which is the second most common gynaecologic cancer and the most common cause of gynaecologic cancer mortality in developed countries, is high-grade serous carcinoma (HGSC) and recent data point to the fimbrial end of the fallopian tube as the origin of the majority of high-grade serous ovarian cancers.<sup>5-8</sup> Given the new understanding regarding the role of the fallopian tube in ovarian cancer, recommendations have been made regarding the treatment of the fallopian tube in common gynaecologic surgeries and the removal of the fallopian tubes for the primary prevention of ovarian cancer in a woman already undergoing pelvic surgery for another indication is termed as opportunistic salpingectomy (OS).<sup>9,10</sup>

The majority of cases of EOC present at an advanced stage and it is likely due to early peritoneal dissemination and an absence of symptoms in early-stage disease. While serum CA125 and pelvic ultrasound have been evaluated as potential strategies for early detection, currently there is no effective screening test for ovarian cancer.<sup>11</sup> Therefore, opportunistic salpingectomy (OS) – removal of the entire fallopian tube with conservation of the ovaries, could be a solution for reducing the risk of ovarian cancer.<sup>8</sup> The practice of opportunistic salpingectomy over the past decade has shown a dramatic reduction in the risk of ovarian cancer in low risk population and the ovarian function also remains unaltered. Large-scale epidemiological studies and meta-analyses have concluded that tubal ligation decreases the risk of endometrioid and clear cell

tumors by >50% and that of serous tumors of the ovary by >25%.<sup>12-14</sup> Recent studies have shown that prophylactic salpingectomy was helpful not only in preventing high-grade serous type ovarian cancer, but also in decreasing other adnexal pathologies.<sup>4,15</sup> The Society of Gynecologic Oncology of Canada (2011), Society of Gynecologic Oncology (2013), and American College of Obstetricians and Gynecologists (2015) have published statements in favour of opportunistic salpingectomy in women at average population risk for ovarian cancer prevention. In recent years, salpingectomy has been increasingly performed for tubal sterilization also.<sup>7,9,16</sup>

Although there is lack of studies regarding the short and long term outcomes of opportunistic salpingectomy and there is some controversy, but several studies showed that the procedure has relatively few or no additional surgical complications.<sup>17-19</sup> A systematic review of opportunistic salpingectomy demonstrated a small to no increase in operative time and no additional blood loss, hospital stay, or complications attributable to salpingectomy at the time of hysterectomy for benign disease.<sup>20</sup> Additionally, ovarian function does not appear to be affected by opportunistic salpingectomy based on surrogate serum markers or response to in vitro fertilization.<sup>10</sup>

In the above mentioned context, practice of opportunistic salpingectomy has gained much popularity all over the world and for last few years it is being practiced in our country also. This study was carried out in a tertiary level hospital of Dhaka, Bangladesh, with the aim of analyzing the trend of opportunistic salpingectomy (OS) performed during hysterectomy.

## Materials and method

This retrospective observational study was conducted in the Department of Obstetrics & Gynaecology, BIRDEM Women and Children Hospital, Dhaka, Bangladesh from October 2019 to March 2022. During the study period, 1585 major gynaecological surgeries were performed

on admitted patients. Among them the number of hysterectomies was 651. Patients with any gynaecologic cancer or having any ovarian or adnexal pathology, and those who underwent hysterectomy due to pregnancy related conditions like ruptured uterus, uncontrolled post partum haemorrhage were excluded and some cases were not included as the data were incomplete. Finally, data of 255 patients undergoing hysterectomy for benign gynaecological disease without involving the ovaries or adnexae were documented. Prior to the study ethical clearance was taken from appropriate authority. All relevant demographic and clinical information were documented from hospital records.

## Results

Mean age of the study subjects was  $48.71 \pm 8.31$  years with an age range of 31 to 76 years. The highest proportion of patients (49.0%) were in the 41-50 years of age group.

**Table I: Age distribution of the study subjects (N=255)**

Agegroup (years)	Frequency	Percentage
31-40	44	17.3%
41-50	125	49.0%
51-60	64	25.1%
61-70	19	7.5%
71-80	3	1.2%

Indications for hospital admission and hysterectomy were analyzed and were categorized according to age group. The commonest indication was abnormal uterine bleeding due to leiomyoma (AUB-L) in 87 patients (34.1%) followed by abnormal uterine bleeding due to adenomyosis (AUB-A) and postmenopausal bleeding due to endometrial hyperplasia in 48 and 47 patients (18.8% and 18.4%) respectively. Highest number

of AUB-L and AUB-A patients were in the 41-50 years age group (18.82% and 15.29%) respectively. (Table II)

**Table II: Distribution of the study subjects according to indication and according to age group (N=255)**

Indication	Frequency (%)	Age group				
		31-40	41-50	51-60	61-70	71-80
AUB-L	87 (34.1 %)	29 (11.37%)	48 (18.82%)	9 (3.52%)	1 (0.39%)	0
AUB-A	48 (18.8 %)	7 (2.74%)	39 (15.29%)	2 (0.78%)	0	0
Endometrial hyperplasia	47 (18.4 %)	0	4 (1.56%)	27 (10.58%)	16 (6.27%)	0
Pelvic organ prolapse	27 (10.6 %)	0	1 (0.39%)	21 (8.23%)	2 (0.39%)	3 (1.17%)
AUB-A,L	23 (9.0 %)	4 (1.56%)	17 (6.66%)	2 (0.39%)	0	0
AUB-O	23 (9.0 %)	4 (1.56%)	16 (6.27%)	3 (1.17%)	0	0

\* Abnormal uterine bleeding due to leiomyoma (AUB-L), Abnormal uterine bleeding due to adenomyosis (AUB-A), Abnormal uterine bleeding due to adenomyosis & leiomyoma (AUB-A,L), Abnormal uterine bleeding due to ovarian dysfunction (AUB-O)

During the study period the hysterectomies were done either through abdominal, laparoscopic or vaginal route and the procedures were either total abdominal hysterectomy (TAH), laparoscopy assisted vaginal hysterectomy (LAVH), total laparoscopic hysterectomy (TLH) or vaginal hysterectomy (VH). The data are tabulated below. (Table III)

**Table III: Route and procedure of hysterectomy (N=255)**

Route of hysterectomy	Procedure	Frequency	Percentage
Abdominal	Total abdominal hysterectomy (TAH)	205	80.4%
Laparoscopic	Laparoscopy assisted vaginal hysterectomy (LAVH)	26	10.2%
	Total laparoscopic hysterectomy (TLH)	3	1.2%
Vaginal	Vaginal hysterectomy (VH)	21	8.2%

During hysterectomy ovaries and fallopian tubes were removed in 131 cases (51.4%) and when ovaries were preserved opportunistic salpingectomy was done in 72 cases (28.2%). In some cases unilateral salpingo-oophorectomy (4.7%) and unilateral salpingo-oophorectomy with contralateral salpingectomy (4.7%) was

done. In a few cases of total abdominal hysterectomy (TAH) and in all the vaginal hysterectomy (VH) cases both the ovaries and fallopian tubes were preserved.

**Table IV: Management of ovaries and fallopian tubes during hysterectomy (N=255)**

Management of ovaries and fallopian tubes	Frequency	Percentage
Bilateral salpingo-oophorectomy	131	51.4
Opportunistic salpingectomy	72	28.2
Unilateral salpingo-oophorectomy	12	4.7
Unilateral salpingo-oophorectomy with contralateral salpingectomy	12	4.7
Both the ovaries and fallopian tubes preserved	28	11.0

Out of 255 study subjects, mean age of the 131 patients undergoing bilateral salpingo-oophorectomy was  $51.95 \pm 7.99$  years with an age range of 38 to 71 years. Whereas, the mean age of the 72 patients undergoing opportunistic salpingectomy was  $42.68 \pm 3.97$  years with an age range of 31 to 50 years.

**Table V: Age distribution of patients undergoing bilateral salpingo-oophorectomy and opportunistic salpingectomy (N=255)**

Variables	Mean age $\pm$ SD	p-value
Bilateral salpingo-oophorectomy group	$51.95 \pm 7.99$	<0.001
Opportunistic salpingectomy group	$42.68 \pm 3.97$	

\*Unpaired t-test was done

\* Level of significance <0.05

Distribution of management of ovaries and fallopian tubes among different hysterectomy procedures are shown in Table VI. Among the 205 patients undergoing total abdominal hysterectomy (TAH), 59.51% patients had undergone bilateral salpingo-oophorectomy and among the 26 patients undergoing laparoscopy assisted vaginal hysterectomy (LAVH), 26.92% patients had undergone bilateral salpingo-oophorectomy. Seventy three percent of laparoscopic hysterectomies were performed with opportunistic salpingectomy, whereas only 25.36% of abdominal hysterectomies had opportunistic salpingectomy.

**Table VI: Distribution of management of ovaries and fallopian tubes among different hysterectomy procedures (N=255)**

Procedure	Management of ovaries and fallopian tubes	Frequency	Percentage
TAH (n=205)	Bilateral salpingo-oophorectomy	122 (59.51%)	47.8
	Unilateral salpingo-oophorectomy	12 (5.85%)	4.7
	Unilateral salpingo-oophorectomy with contralateral salpingectomy	12 (5.85%)	4.7
	Opportunistic salpingectomy	52 (25.36%)	20.4
LAVH (n=26)	Both the ovaries and fallopian tubes preserved	7 (3.41%)	2.7
	Bilateral salpingo-oophorectomy	7 (26.92%)	2.7
TLH (n=3)	Opportunistic salpingectomy	19 (73.07%)	7.5
	Bilateral salpingo-oophorectomy	2 (66.66%)	.8
VH (n=21)	Opportunistic salpingectomy	1 (33.33%)	.4
	Both the ovaries and fallopian tubes preserved	21 (100.0%)	8.2

Distribution of management of ovaries and fallopian tubes among different indications of hysterectomy are shown in Table VII. Among the 255 patients undergoing hysterectomy, AUB-L was the commonest indication (34.1%), with 14.50% women having bilateral salpingo-oophorectomy (BSO) and another 14.50% having opportunistic salpingectomy (OS).

**Table VII: Distribution of management of ovaries and fallopian tubes among different indications of hysterectomy (N=255)**

Indication	Bilateral salpingo-oophorectomy	Unilateral salpingo-oophorectomy	Unilateral salpingo-oophorectomy with contralateral salpingectomy	Opportunistic salpingectomy	Preserved	Total
AUB-L	39 (15.29%)	4 (1.56%)	7 (2.74%)	35 (13.72%)	2 (0.78%)	87
AUB-A	17 (6.66%)	4 (1.56%)	2 (0.78%)	24 (9.41%)	1 (0.39%)	48
Endometrial hyperplasia	46 (18.03%)	0	0	1 (0.39%)	0	47
Pelvic organ prolapse	6 (2.35%)	0	0	0	21 (8.23%)	27
AUB-A.L	12 (4.70%)	2 (0.78%)	0	5 (1.96%)	4 (1.56%)	23
AUB-O	11 (3.52%)	2 (0.78%)	3 (1.17%)	7 (2.74%)	0	23
Total	131	12	12	72	28	255

\* Abnormal uterine bleeding due to leiomyoma (AUB-L), Abnormal uterine bleeding due to adenomyosis (AUB-A), Abnormal uterine bleeding due to adenomyosis & leiomyoma (AUB-A, L), Abnormal uterine bleeding due to ovarian dysfunction (AUB-O).



The trend of opportunistic salpingectomy gradually increased during the studied period. In the last three months of the year 2019 proportion of opportunistic salpingectomy was 17.39% among total 23 hysterectomies and the percentage gradually increased over the study period which was 36.17% in the first three months of the year 2022.

**Table VIII: Year wise management of ovaries and fallopian tubes (N=255)**

Year	Bilateral salpingo-oophorectomy	Unilateral salpingo-oophorectomy	Unilateral salpingo-oophorectomy with contralateral salpingectomy	Opportunistic salpingectomy	Preserved
2019 (n=23)	15 (65.21%)	3 (13.04%)	0	4 (17.39%)	1 (4.34%)
2020 (n=79)	39 (49.36%)	6 (7.59%)	3 (3.79%)	19 (24.05%)	12 (15.18%)
2021 (n=106)	59 (55.66%)	2 (1.88%)	6 (5.66%)	32 (30.18%)	7 (6.60%)
2022 (n=47)	18 (38.29%)	1 (2.12%)	3 (6.38%)	17 (36.17%)	8 (17.02%)

## Discussion

Since the publication of several international guidelines regarding the benefits of it, the practice of opportunistic salpingectomy has dramatically increased throughout the world. A number of studies have been conducted worldwide regarding the practice and trend of opportunistic salpingectomy and awareness of gynaecologists about this preventive measure against ovarian carcinoma.

In our study, mean age of the 255 patients undergoing hysterectomy for benign gynaecological disease without involving the ovaries or adnexae was  $48.71 \pm 8.31$  years with an age range of 31 to 76 years. In an Indian study, average age of patients undergoing hysterectomy was 45.78 years.<sup>21</sup> The highest proportion of patients (49.0%) of this study was in the 41-50 years of age group which was consistent with the findings of several other Bangladeshi studies and studies done abroad. In studies by Hossain et al.<sup>22</sup>, and Nazneen et al.<sup>23</sup>, majority of patients

undergoing total abdominal hysterectomy was found to be in the age group of 41-50 years. Subrata et al.<sup>21</sup> and Raza et al.<sup>24</sup> reported that the highest percentage of patients was among 40-49 years.

Decision of bilateral salpingo-oophorectomy (BSO) was mainly influenced by age in absence of any ovarian or adnexal pathology as the results suggest that BSO was done preferably in older women. Among the study population mean age of the 131 patients undergoing BSO was  $51.95 \pm 7.99$  years with an age range of 38 to 71 years. Whiteman et al.<sup>25</sup> also commented that age at the time of hysterectomy influences BSO rates; in their study among women of 50-54 years 78% underwent BSO compared to 37% of women aged 15-44 years. In a study by Jacoby et al.<sup>2</sup>, 52% of hysterectomies were done with BSO, with a mean age of 49 years compared to 43 years in the hysterectomy only group. Opportunistic salpingectomy (OS) was preferred in younger patients among our study subjects. Mean age of the 72 patients undergoing opportunistic salpingectomy was  $42.68 \pm 3.97$  years with an age range of 31 to 50 years. Mean  $\pm$  SD age of the patients undergoing opportunistic salpingectomy was  $40.2 \pm 7.1$  years in a population-based cohort study in the British Columbia state of Canada.<sup>26</sup> Karia et al.<sup>27</sup> also reported that in their study population 56% of hysterectomy with OS were performed in women of <45 years.

Indication for the hysterectomies were analyzed. The study purposively included only the benign conditions and any pathology involving the ovaries and adnexae were also excluded. The commonest indication in this study was abnormal uterine bleeding due to leiomyoma (AUB-L) followed by abnormal uterine bleeding due to adenomyosis (AUB-A); with the frequency of 34.1% and 18.8% respectively. Both the conditions were mostly found in the 41-50 year age group (18.82% and 15.29%). In another Bangladeshi study, Nazneen et al.<sup>23</sup> reported that most of the abdominal hysterectomies were due to leiomyoma (46%) and done during 3rd and 4th decade. It was followed by abnormal uterine

bleeding due to ovarian dysfunction (AUB-O), pelvic inflammatory disease (PID) and adenomyosis, all of which were among 41-50 year age group. Leiomyoma was also the commonest indication for hysterectomy in two other studies conducted in Bangladesh.<sup>24,28</sup> This finding is also in accordance with other studies done abroad.<sup>29</sup>

As AUB-L or leiomyoma was the commonest indication in this study, women with leiomyoma naturally had the highest proportion of opportunistic salpingectomy (OS) which was 13.72%. The highest proportion of bilateral salpingo-oophorectomy (BSO) was performed in women with endometrial hyperplasia (18.03%) as they were done in relatively older women. The finding of our study is similar to that of several other studies.<sup>27,30</sup>

The trend of opportunistic salpingectomy gradually increased during the studied period from 17.39% in 2019 to 36.17% in 2022 which is almost 2-fold. This picture is similar throughout the world since the new guidelines regarding opportunistic salpingectomy have been published. Garcia et al.<sup>31</sup> reported a statistically significant rise in rate of salpingectomy in a community based study in USA over time from 2011 to 2014 and commented that rates of salpingectomy increased significantly over time, consistent with the high acceptance rate reported by health care providers. Mandelbaum et al.<sup>32</sup> also reported that the rate of opportunistic salpingectomy began to increase substantially and reached 58.4% by 2015 in USA. Gynaecologic oncologists in Hualien Tzu Chi Hospital, Taiwan, began performing OS in 2007 and at that time, OS was performed in only 8% of hysterectomies. From 2010, the OS rate increased markedly, being 32% in 2009, 76% in 2010, and approximately 80% in 2011 onward.<sup>16</sup> Another study reported that incidence rates of OS increased nearly 8-fold between the years 2010 and 2017.<sup>30</sup> The same trend was noted in Canada; the OS rate increased from 5% in 2008 to 35% in 2011.<sup>33</sup>

Therefore, it can be concluded that Bangladesh is not too far from the rest of the world in this regard. The practice of opportunistic salpingectomy for

prevention of ovarian cancer has already been accepted by our gynaecologists and we hope that it will be more widely practiced in the coming years.

Limitation of our study is that due to inadequate record keeping all the related data of all hysterectomies could not be included. So we had to exclude some of the hysterectomy cases from the study. We should emphasize on proper record keeping for future studies. There is a great need for prospective, large scale and multi-centre studies to evaluate the safety and efficacy of opportunistic salpingectomy as a preventive strategy for ovarian cancer and to provide more information of opportunistic salpingectomy from general population in Bangladesh.

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