



An audit of hysterectomy in a teaching hospital in India: Story of a decade

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Abstract

Background: The appropriateness of hysterectomy has gained an interest in scrutiny and debate. Periodic audits of the prevailing clinical practices are imperative for insight, and to formulate recommendations and guidelines. We report the temporal trends of hysterectomies, over the last 10 years in a teaching hospital.

Methods: Present study involved all patients who underwent hysterectomy at a teaching hospital, from January 1, 2012 to December 31, 2021. Patients were identified by medical record tracking using International Classification of Diseases-9 codes. Case records were reviewed for demography, indication for surgery, approach, complications, hospital stay, and histopathological correlation.

Results: Over the years the absolute number of hysterectomies in our hospital has ranged from 414 to 597 (mean 476), barring the coronavirus 19 pandemic year. The proportion of hysterectomy among all gynaecological admissions has ranged from 6% to 9%, except in 2020 where this proportion dropped down to 4%. The indications, age distribution, surgical approach, and complications have remained almost same.

Conclusion: We report a static trend in hysterectomy over the past 10 years. This audit provides an insight for the need of shifting the abdominal to vaginal route, in carefully chosen patients. This will be beneficial for the patients, and for the trainees, where they can learn under supervision. Availability and patient education about the nonsurgical management options for benign gynecological conditions, as well as awareness about sequelae of hysterectomy, will bring down the rate in countries such as India.

Keywords: Adenomyosis; COVID-19; Hysterectomy; Intraoperative complication; Leiomyoma; Pelvic organ prolapse

1. INTRODUCTION

Hysterectomy is the most common gynaecological surgery performed worldwide. More than 90% of the hysterectomies are elective and are performed for a benign indication. Interestingly for most of these conditions, there are effective alternative medical or surgical treatments available.¹ Apart from the immediate complications of surgery in general, the aftermath includes increased risk of cardiovascular diseases, early deaths, dementia, osteoporosis, vault prolapse, incontinence, sexual dysfunction, and the much less talked about the impact on psychological and emotional health.²⁻⁹ More

recently hysterectomy with or without oophorectomy is also being reported to be associated with an increased risk of diabetes mellitus¹⁰ and hypertension.¹¹

The appropriateness of recommendations for hysterectomy thus has gained an interest in scrutiny and debate by media and activists alike. In this scenario, periodic audits by researchers and clinicians, of the prevailing clinical practices are imperative for insight, as well as to formulate recommendations and guidelines for the fellow practitioners.^{12,13}

Data on the frequency of hysterectomy for benign conditions is available in selected countries such as North America, Australia, and Europe.¹⁴⁻¹⁶ Conversely, data from Asian countries, especially from the Indian subcontinent that differs in reproductive and sociocultural patterns, are scant.

Unlike other nations, in India diversity is a rule rather than exception. It exists among states, socio-economic and educational strata.¹⁷ Not only in the exterior but that diversity is seeped deep inside our beliefs and attitude. It is neither feasible nor rationale to extract and exploit mean values for the entire population. We must gather the data from diverse platforms, from urban and rural settings, from private and public hospitals; compare it, understand it and audit it. So that strict guidelines can be formulated and implemented.¹⁸

In this article, we report the temporal trends of hysterectomies for benign gynaecological diseases spread over the last 10

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Proportion of women undergoing Hysterectomy over the past 10 years

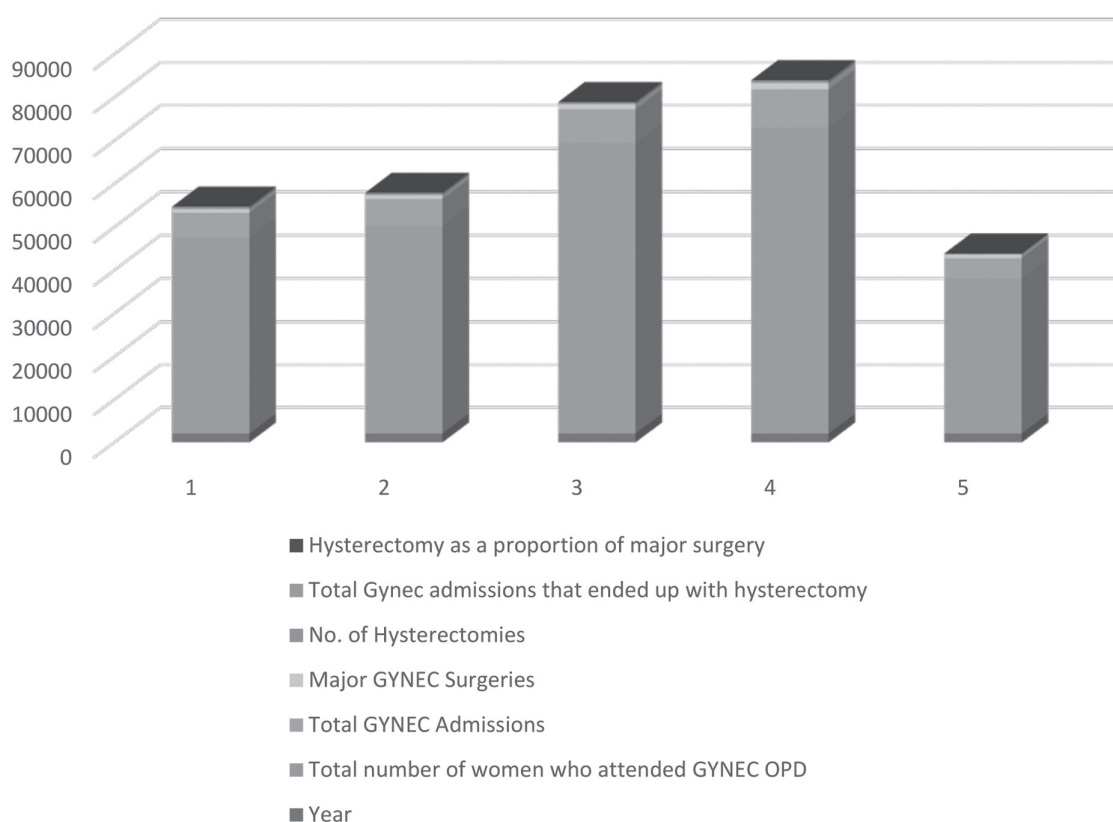


Fig. 1 Proportion of women undergoing hysterectomy over the past 10 years.

years. We intend to present trends of choice of surgical route, common indication, rate of complications, and histological justification of hysterectomy over a decade in a university hospital in India.

2. METHODS

Present study involved all patients who underwent hysterectomy in the Department of Obstetrics and Gynecology at a teaching hospital affiliated with Medical College in Southern India, over a period of 10 years (from January 1, 2012 to December 31, 2021). Patients' consent to review their medical records was not required by the Institutional Review Board as the study was based only on the review of their files. Patient data confidentiality was maintained, and the study was compliant with the Declaration of Helsinki.

Hysterectomies performed in the Department of Surgical Oncology for treatment of cervical, uterine, or ovarian malignancies were not included. Patients were identified by medical record tracking using International Classification of Diseases-9 codes. Case records then were reviewed to collect patient characteristics, indication for surgery, surgical approach or technique, complications, length of hospital stay, and histopathology examination report of the specimen obtained during surgery. Intensive care admissions and repeat laparotomies were also assessed.

All elective as well as emergency hysterectomies (including obstetric hysterectomies) were analyzed. Cases where on

table decision to proceed with hysterectomy was taken were also included. Abdominal hysterectomies included supracervical hysterectomy, total hysterectomy, and total hysterectomy with unilateral salpingo-oophorectomy/orthototal hysterectomy with bilateral salpingo-oophorectomy/ oophorectomy. It also included hysterectomy performed as a part of staging laparotomy for an ovarian tumor and radical hysterectomy performed for early-stage cervical carcinoma in the Department of Obstetrics and Gynecology by a Gynecologist. Vaginal hysterectomies included vaginal hysterectomy with pelvic floor repair for pelvic organ prolapse and also nondescent vaginal hysterectomy for indications other than prolapse. Laparoscopic hysterectomy group had both laparoscopic-assisted vaginal hysterectomy and total laparoscopic hysterectomy.

For all cases, indications for surgery were reviewed. Some of the women had more than one indication. As a part of subanalysis, indications where hysterectomy was performed in women less than 30 years of age were carefully reviewed. Intraoperative blood loss, injury to vital structures, and conversion of the planned route were compared among various approaches.

At the end, the main postoperative histopathology diagnosis was recorded. Preoperative indication was compared with the pathologist's report of the removed specimen following surgery. Hysterectomy was considered justified if the pathology report verified the indication for surgery or showed a significant alternative pathology.

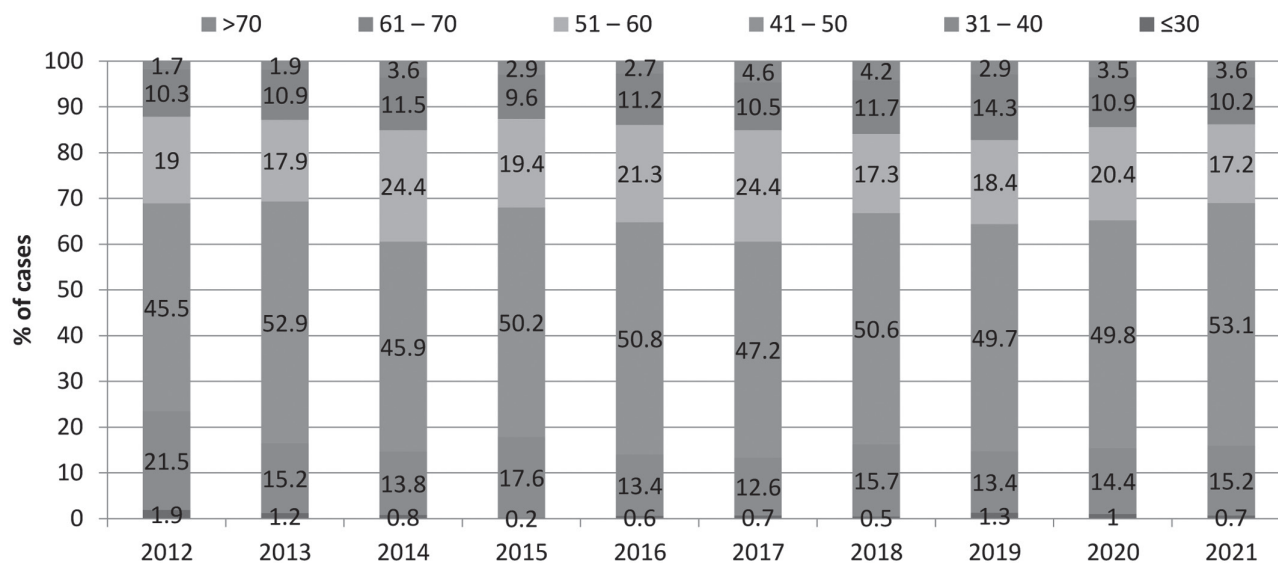


Fig. 2 Age distribution of cases studied.

Route of hysterectomy

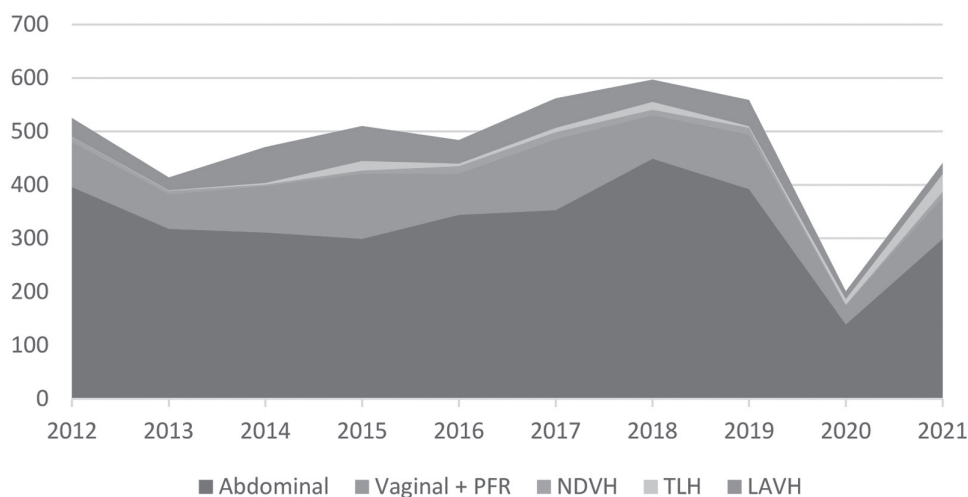


Fig. 3 Comparison of the route of hysterectomies among the cases studied.

Rates of hysterectomy for each year were calculated as total hysterectomy cases in that year divided by the total number of women who attended the outpatient care during the same year. Changing trends in the rates of hysterectomy, route of surgery, indication, complications, and histopathological justification over a 10-year study period were compared and analyzed.

2.1. Statistical analysis

Year-wise data on categorical variables are shown as n (% of cases). The inter-group statistical comparisons of the distribution of categorical variables across various years are tested using the chi-square test or Fisher's exact probability test if more than 20% of cells have an expected frequency of less than 5. The statistical significance of the linear trend in the distribution of different surgical indications across the

study period is tested using a linear-by-linear association test or ordinal chi-square test.¹⁹ In the entire study, *p* values less than 0.05 are considered to be statistically significant. The entire data is statistically analyzed using Statistical Package for Social Sciences (SPSS ver 24.0, IBM Corporation, USA) for MS Windows.

3. RESULTS

In last 10 years, a total of 5 51 144 women attended the gynecology outpatient department, in our hospital. Out of which 4764 (6.9%) underwent hysterectomy. The mean rate of hysterectomy is 0.86%. Over the years the absolute number of hysterectomies in our hospital has ranged from 414 to 597 (mean 476), barring the year of the coronavirus 19 (COVID 19) pandemic (2020). The proportion of hysterectomy among all gynecological

admissions has ranged from 6% to 9%, except in 2020 where this proportion dropped down to 4% (Table 1).

An ancillary finding to be noted is the trend of women seeking health care for gynecological issues was showing an upward trend up to the year of the pandemic (2012–2018). The number of women seeking reproductive health care is seeing a downfall in the last 3 years. (Fig 1)

Around half of the women who underwent hysterectomy belonged to the age group of 41 to 50 years. This was followed by the 51 to 60 years age bracket. The trend has been similar over the

years. Hysterectomies (0.2 %–1.9%) under the age of 30 years were all postpartum hysterectomies, (post-partum hemorrhage, morbidly adherent placenta, or uterine rupture) (Table 2). (Fig 2)

Table 3 summarises the distribution of various routes of hysterectomies in our set-up in the last 10 years. The abdominal route has been the most common route of hysterectomy throughout. The proportion of various routes and types of hysterectomy has remained similar over the years. Despite the dramatic fall in the absolute number of hysterectomies in the year 2020, the proportion of approaches has remained unchanged (Table 3). (Fig 3)

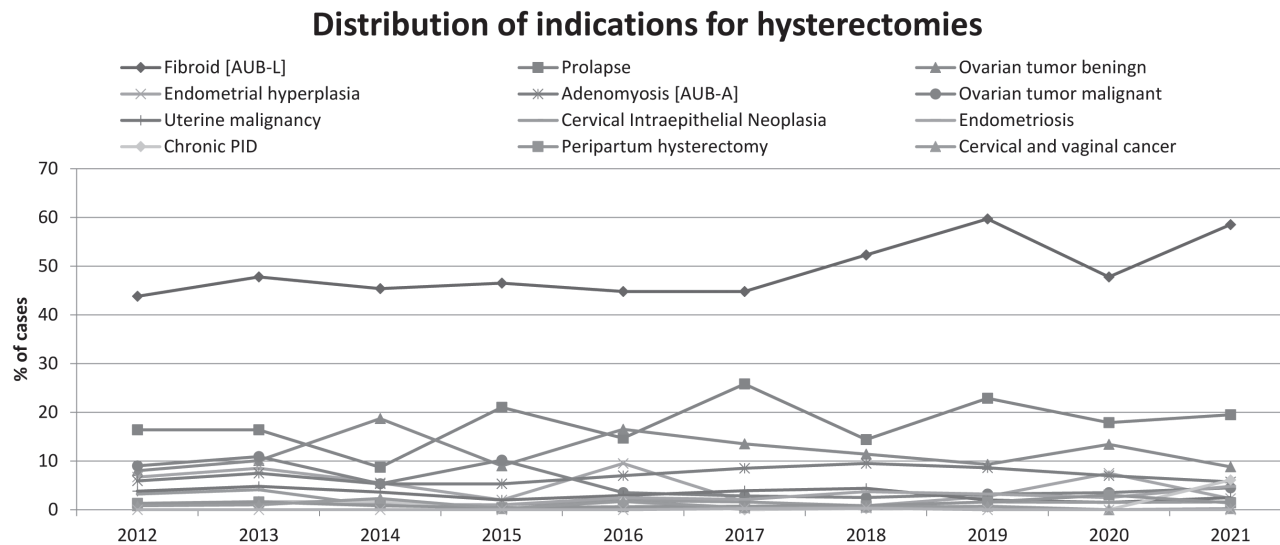


Fig. 4 Distribution of indications for hysterectomy.

Table 1
Distribution of Number of Cases

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Total number of women who attended GYNOPD	45 423	47 663	48 178	57 333	67 296	72 932	70 875	66 037	35 963	39 444	55 1144
Total GYNOPD admissions	5867	6100	6232	7739	7892	8570	8936	8158	4773	4756	69 023
Major GYNOPD surgeries	859	919	982	1123	1190	1426	1511	1395	891	1044	11 340
No. of hysterectomies	525	414	471	510	484	562	597	559	201	441	4764
Rate of hysterectomy	1.15%	0.86%	0.97%	0.89	0.72%	0.77%	0.84%	0.85%	0.56%	1.12%	0.86%
Proportion of gynec admissions for hysterectomy	8.94%	6.78%	7.55%	6.58%	6.13%	6.55%	6.68%	6.85%	4.21%	9.27%	6.90%
Hysterectomy as a proportion of major surgery	61.11%	45.04%	47.96%	45.41%	40.67%	39.41%	39.51%	40.07%	22.55%	42.24%	42.01%

OPD = outpatient department.

Table 2
Age Distribution of Cases Studied

Year	Age Group (years)												Total	
	≤30		31–40		41–50		51–60		61–70		>70		n	%
2012	10	1.9	113	21.5	239	45.5	100	19.0	54	10.3	9	1.7	525	100.0
2013	5	1.2	63	15.2	219	52.9	74	17.9	45	10.9	8	1.9	414	100.0
2014	4	0.8	65	13.8	216	45.9	115	24.4	54	11.5	17	3.6	471	100.0
2015	1	0.2	90	17.6	256	50.2	99	19.4	49	9.6	15	2.9	510	100.0
2016	3	0.6	65	13.4	246	50.8	103	21.3	54	11.2	13	2.7	484	100.0
2017	4	0.7	71	12.6	265	47.2	137	24.4	59	10.5	26	4.6	562	100.0
2018	3	0.5	94	15.7	302	50.6	103	17.3	70	11.7	25	4.2	597	100.0
2019	7	1.3	75	13.4	278	49.7	103	18.4	80	14.3	16	2.9	559	100.0
2020	2	1.0	29	14.4	100	49.8	41	20.4	22	10.9	7	3.5	201	100.0
2021	3	0.7	67	15.2	234	53.1	76	17.2	45	10.2	16	3.6	441	100.0

Table 3
Distribution of Route and Type of Hysterectomies Among the Cases Studied

Year	Abdominal						Vaginal						Laparoscopic											
	TAH		TAH + USO		TAH + BSO		Subtotal hysterectomies		Staging laparotomy		Radical hysterectomy		VH + PFR		NDVH		LAVH		TLH		Total			
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%		
2012	69	13.1	16	3.0	235	44.8	1	0.2	6	1.1	64	12.2	5	1.0	84	16.0	10	1.9	34	6.5	1	0.2	525	100.0
2013	59	14.3	14	3.4	181	43.7	0	0.0	6	1.4	53	12.8	5	1.2	64	15.5	7	1.7	24	5.8	1	0.2	414	100.0
2014	74	15.7	12	2.5	176	37.4	2	0.4	4	0.8	35	7.4	8	1.7	87	18.5	3	0.6	67	14.2	3	0.6	471	100.0
2015	67	13.1	25	4.9	152	29.8	0	0.0	1	0.2	52	10.2	2	0.4	122	23.9	6	1.2	65	12.7	18	3.5	510	100.0
2016	99	20.5	35	7.2	169	34.9	0	0.0	3	0.6	37	7.6	1	0.2	77	15.9	14	2.9	44	9.1	5	1.0	484	100.0
2017	71	12.6	30	5.3	193	34.3	0	0.0	4	0.7	53	9.4	2	0.4	132	23.5	14	2.5	55	9.8	8	1.4	562	100.0
2018	71	11.9	38	6.4	301	50.4	0	0.0	5	0.8	33	5.5	1	0.2	81	13.6	11	1.8	41	6.9	15	2.5	597	100.0
2019	60	10.7	23	4.1	286	51.2	0	0.0	9	1.6	13	2.3	1	0.2	102	18.2	13	2.3	49	8.8	3	0.5	559	100.0
2020	23	11.4	10	5.0	93	46.3	3	1.5	6	3.0	4	2.0	0	0.0	36	17.9	1	0.5	14	7.0	11	5.5	201	100.0
2021	46	10.4	43	9.8	183	41.5	0	0.0	6	1.4	17	3.9	4	0.9	77	17.5	12	2.7	20	4.5	33	7.5	441	100.0

BSO = bilateral salpingo-ovariectomy; LAVH = laparoscopic-assisted vaginal hysterectomy; NDVH = nondescent vaginal hysterectomy; TAH = total hysterectomy; TLH = total laparoscopic hysterectomy; USO = unilateral salpingo-ovariectomy; VH-PFR = vaginal hysterectomy with pelvic floor repair.

Table 4
Distribution of Elective and Emergency Hysterectomies Among the cases Studied

Year	Elective		Emergency		Total	
	n	%	n	%	n	%
2012	514	97.9	11	2.1	525	100.0
2013	406	98.1	8	1.9	414	100.0
2014	464	98.5	7	1.5	471	100.0
2015	509	99.8	1	0.2	510	100.0
2016	479	98.9	5	1.1	484	100.0
2017	557	99.1	5	0.9	562	100.0
2018	590	98.8	7	1.2	597	100.0
2019	548	98.0	11	2.0	559	100.0
2020	195	97.0	6	3.0	201	100.0
2021	433	98.2	8	1.8	441	100.0

Most of the hysterectomies were performed electively. The proportion of emergency hysterectomies has remained less than 2% throughout (Table 4). The indication are summarized in Table 5. Around 92% of all hysterectomies in our setup were for benign gynecological conditions. Most common indication has been symptomatic leiomyoma followed by pelvic organ prolapse. (Fig 4) Some cases had more than one indication. As shown in the last two columns in Table 5 *p* values were calculated to determine the equality of distribution and trend analysis for most common indications. The first *p* value in the table shows the equality of distribution of various indications across the study period (Years 2012 through 2021). A statistically significant difference in the distribution of indications across the years was found among most of the common indications except adenomyosis. The second *p* value (trend) denotes the probability of a linear trend (ascending or descending) in the distribution of various indications over the last 10 years. There seems to be a statistically significant linear trend (approximately could be decreasing or increasing) in the distribution of common indications across the years (except for adenomyosis). Even after ignoring the 2020 data (the COVID-19 pandemic year), the statistics especially trend significance did not show gross changes.

Duration of hospital stay was least among the laparoscopically performed cases, followed by hysterectomies carried out vaginally. The duration of stay has been charted in Table 7 and is inclusive of the preoperative period as well as the day of surgery. Minimum duration of stay is noted in the year 2020 (the COVID-19 pandemic year) (Table 7).

Mortality following hysterectomy has been nil to 0.5% in our setup. This includes elective as well as emergency cases. (Table 6) The rate of complications (minor and major) ranged between 0.2% and 4.0 % over the years. Hemorrhage requiring transfusions is the most common complication and the incidence has shown an increasing trend over the years. The *p* value given for the complications table indicates the probability of equality of distribution of incidence of various complications across the study period.

Based on the histopathological report 99% or more hysterectomies in our setup were found to be justified. Preoperative diagnosis has shown a good correlation with the postoperative confirmatory histopathology obtained from the specimen. The correlation has been increasing over the years and in the year 2021 it has reached 91% (Table 8).

4. DISCUSSION

In our study cohort of 10 years, the hysterectomy trend for benign gynaecological diseases has remained constant except for

Table 5
Distribution of Indications for Hysterectomies (Some cases had more than one indication)

Indications	2012		2013		2014		2015		2016		2017		2018		2019		2020		2021		p (Distribution)	p (Trend)
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%		
Benign	86	16.4	68	16.4	41	8.7	107	21.0	71	14.7	145	25.8	86	14.4	128	22.9	36	17.9	86	19.5	0.001***	0.001***
Prolapse	230	43.8	198	47.8	214	45.4	237	46.5	217	44.8	252	44.8	312	52.3	334	59.7	96	47.8	258	58.5	0.001***	0.001***
Fibroid [AUB-L]	31	5.9	31	7.5	25	5.3	27	5.3	34	7.0	48	8.5	57	9.5	48	8.6	14	7.0	25	5.7	0.059 ^{NS}	0.124 ^{NS}
Adenomyosis [AUB-A]	7	1.3	7	1.7	5	1.1	5	1.0	12	2.5	12	2.1	22	3.7	18	3.2	5	2.5	21	4.8	0.001***	0.001***
Endometriosis	7	1.3	7	1.7	8	1.7	1	0.2	8	1.7	0	0.0	1	0.2	3	0.5	0	0.0	27	6.1	0.001***	0.007**
Chronic PID	42	8.0	42	10.1	88	18.7	46	9.0	80	16.5	76	13.5	68	11.4	52	9.3	27	13.4	39	8.8	0.001***	0.527 ^{NS}
Ovarian tumor benign	7	1.3	7	1.6	4	0.8	2	0.4	3	0.6	4	0.7	5	0.8	9	1.6	6	3.0	6	1.4	0.189 ^{NS}	0.415 ^{NS}
Peripartum hysterectomy	17	3.2	17	4.1	4	0.8	5	1.0	9	1.9	9	1.6	5	0.8	9	1.6	3	1.5	7	1.6	0.002**	0.007**
Cervical Intraepithelial Neoplasia	35	6.7	35	8.5	26	5.5	10	2.0	46	9.5	9	1.6	5	0.8	15	2.7	15	7.5	10	2.3	0.001***	0.001***
Endometrial hyperplasia																						
Malignant	4	0.8	4	1.0	11	2.3	1	0.2	8	1.7	2	0.4	3	0.5	4	0.7	0	0.0	1	0.2	0.002**	0.025*
Cervical and vaginal cancer	20	3.8	20	4.8	17	3.6	10	2.0	14	2.9	22	3.9	26	4.4	11	2.0	3	1.5	11	2.5	0.073 ^{NS}	0.015*
Uterine malignancy	47	9.0	45	10.9	25	5.3	52	10.2	17	3.5	16	2.8	15	2.5	18	3.2	7	3.5	20	4.5	0.001***	0.001***
Ovarian tumor malignant	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.2	2	0.3	0	0.0	0	0.0	0	0.0	--	--
Gestational Trophoblastic Neoplasia																						

AUB-A = abnormal uterine bleeding- adenomyosis; AUB-L = abnormal uterine bleeding- leiomyoma; NS = statistically non-significant; PID = pelvic inflammatory disease.
 p by Chi-Square test, p<0.05 is considered to be statistically significant.
 *p<0.05.
 **p<0.01.
 ***p<0.001.

the COVID-19 pandemic year. The pandemic, impacted medical care dramatically, all across the world. New policies were put in place to overcome the crisis, conserve resources and ensure safety. There are reports from many parts of the world discussing how the pandemic affected essential care for patients with cancers. This includes gynaecological cancers requiring hysterectomy.²⁰⁻²³ A few reports are available documenting the delay in the management of women requiring hysterectomy for benign gynaecological conditions. These studies reported a drastic decrease of around 65% to 75%, in total number of major gynecological surgeries performed during this time period.^{24,25} The rate of hysterectomy is highest (1.12%) in the year 2021. Seemingly it was a rebound after the COVID-19 pandemic as many women who required hysterectomy, during 2019 and 2020, were put in the waiting list for a later date.

In our setup, around half of the women who underwent hysterectomy belonged to the age group of 41 to 50 years. This was followed by the 51 to 60 years age bracket. The trend has been similar over the years in our hospital. In Taiwan, the peak age for women who underwent hysterectomies was 40 to 44 years.²⁶ In Finland the median age at hysterectomy has shifted from 51 years in 1998–2001 to 55 years in 2014–2017.²⁷ China reported more than 75% of hysterectomies in the age group of 50 to 59 years.²⁸ In Tanzania mean age for hysterectomy was 48.8 ± 8.6 years.²⁹ This difference may be related to the availability and acceptability of nonsurgical treatments for benign gynecological pathologies among different nations and geographical locations.

Hysterectomy rates for benign gynaecological conditions exhibit a decline over the past two decades in Australia, US, Sweden, and Taiwan.²⁶ Similar declining trends have been observed in Europe too. A 15-year study (1996–2010), from Italy, observed a marked decrease in the frequency of hysterectomy, in their setup.³⁰ Austria reported a 27% decline in the rate of hysterectomy for benign conditions from 2002 to 2014.³¹ In a trend analysis from Portugal, the rate of hysterectomies decreased in a span of 15 years (2000–2014) with an increase in age at the time of the procedure and a change towards less invasive routes.³² The possible reason for the decreasing trend of hysterectomy could be the introduction of non-surgical treatment options, for benign diseases of uterus. To opt for conservative options requires the need for long-term follow-up, the introduction of screening programs in the health care delivery chain, easy access to conservative modalities such as uterine artery embolization, endometrial ablation procedures, high-intensity focused ultrasound therapy and related cost factors. Owing to the sparsity of these in a developing country setup, the trends of hysterectomy may seem to remain unchanged. Patient's perception of hysterectomy as a one-time treatment choice in our setup might also have contributed to the static rate of hysterectomies over the years.

The data from the developing world, on this subject matter, is limited. A study from Gujrat, India reported an estimated prevalence of hysterectomy to be 20.7 per 1000 woman-years, which is four times higher than the highest global rates.³³ The National Family Health Survey-4 in India provided the first nationally representative estimates of hysterectomy. It revealed the highest prevalence in the states of Andhra Pradesh, Bihar, Gujarat, and Telangana. The lowest rate of hysterectomy was reported in Punjab, Chhattisgarh, West Bengal, and Kerala, as well as all eight north-eastern states.³⁴

Table 6
Distribution of Incidence of Complications (Some Cases had More Than One Complication)

Complications	2012		2013		2014		2015		2016		2017		2018		2019		2020		2021	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Bowel injury	2	0.38	1	0.24	2	0.42	1	0.20	2	0.36	2	0.34	2	0.36	2	0.36	1	0.36	0	0.00
Bladder injury	5	0.95	4	0.97	4	0.85	5	0.98	5	1.03	4	0.50	3	0.71	4	0.72	0	0.00	2	0.45
Ureteric injury	1	0.19	1	0.24	3	0.64	1	0.20	2	0.41	0	0.00	0	0.00	0	0.00	0	0.00	1	0.23
UTI	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	10	1.68	10	1.78	8	1.43	8	3.98	6	1.36
Blood loss (>1000mL)	21	4.00	17	4.11	18	3.82	8	1.57	17	3.51	29	5.16	24	4.02	27	4.83	18	8.96	68	15.42
Wound infection/gape	10	1.90	3	0.72	9	1.91	7	1.37	7	1.45	10	1.78	11	1.84	15	2.68	0	0.00	7	1.59
Burst abdomen	2	0.38	0	0.00	0	0.00	0	0.00	0	0.00	1	0.18	1	0.17	0	0.00	0	0.00	1	0.23
Pelvic abscess	2	0.38	0	0.00	1	0.21	0	0.00	1	0.21	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
ICU admission	1	0.19	1	0.24	0	0.00	2	0.39	3	0.62	5	0.89	6	1.01	11	1.97	8	3.98	13	2.95
Vault hematoma	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	3	0.53	2	0.34	2	0.36	0	0.00	0	0.00
DVT	0	0.00	0	0.00	0	0.00	1	0.20	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	0.23
paralytic ileus	0	0.00	0	0.00	0	0.00	4	0.78	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Intestinal obstructions	2	0.38	2	0.48	1	0.21	0	0.00	1	0.21	4	0.71	3	0.50	5	0.89	1	0.50	15	3.40
Pneumonia	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	2	0.36	2	0.34	2	0.36	0	0.00	0	0.00
Electrolyte imbalance	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	4	0.71	4	0.67	4	0.72	3	1.49	5	1.13
Exaggeration of comorbidities	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	16	2.85	16	2.68	28	5.01	19	9.45	50	11.34
Mortality	1	0.19	1	0.24	1	0.21	1	0.20	1	0.20	0	0.00	3	0.50	1	0.18	1	0.50	2	0.45
Total	47	8.95	24	5.79	39	8.28	30	5.88	39	8.06	90	16.01	87	14.57	109	19.50	59	29.35	179	40.59
ρ	0.001***		0.001***		0.001***		0.001***		0.001***		0.001***		0.001***		0.001***		0.001***		0.001***	

DVT = deep vein thrombosis; ICU = Intensive Care Unit; UTI = urinary tract infection.
 ρ by Chi-Square test. $p < 0.05$ is considered to be statistically significant.
 *** $p < 0.001$.

India is a diverse nation in terms of its socio-economics, education level, beliefs, and attitude. It is neither possible nor rational to extract and exploit mean data for the entire population. To formulate workable guidelines, we must collect the data from diverse platforms, from urban and rural settings, from private and public hospitals; compare it, understand it and audit it.

Over the last 10 years abdominal route has been the preferred route of hysterectomy in our setup. Similarly, in China, 84% of hysterectomies were performed by an open abdominal approach.²⁸ In Taiwan, the transition of open abdominal hysterectomy predominance to laparoscopic hysterectomy predominance occurred in two phases (between 2003–2005 and 2008–2012). The rate of abdominal hysterectomy decreased from 62.7% to 36.5%. It was concomitantly associated with an increase in laparoscopic hysterectomies.²⁶ Similarly in the US too, the hysterectomy route has shifted considerably from abdominal to laparoscopic.³³ Even in this era of minimally invasive surgeries, comparison of various routes of hysterectomy has found the vaginal route to be the best.

The American College of Obstetricians and Gynecologists recommends, the vaginal route as the first option for hysterectomy, whenever feasible, even in the era of minimally invasive surgery.³⁵ Vaginal hysterectomy is less invasive, with lower complication rates as compared to abdominal, laparoscopic, and robotic routes.^{36,37} In our cohort consistently vaginal route has been the less favored one, for the non-prolapse cases. This may owe to the fact that our hospital caters a large number of trainees, who first need to be well versed with anatomic details and basic training in gynecological surgeries. This can be best achieved by an open abdominal approach. However, as vaginal hysterectomy is the universally accepted best approach for hysterectomy for benign conditions, we must incorporate it in the training and skill transfer programs as well.^{37–40}

Various studies have reported that the choice of route of hysterectomy is also influenced by the surgeon's age and gender.^{26,41,42} This is one of the limitations of our study that while collating the data we did not keep in mind this factor. In future studies and audits, however, we will try to incorporate this information.

Around 92% of all hysterectomies in our setup were for benign gynaecological conditions. Most common indication has been symptomatic leiomyoma followed by pelvic organ prolapse. Despite the availability and popularisation of conservative approaches for the management of leiomyoma, remains the leading indication of hysterectomy globally.⁴³

The rate of complications (minor and major) ranged between 0.2% and 4.0% over the years. Hemorrhage requiring transfusions is the most common complication and the incidence has shown an increasing trend over the years. We hypothesize it to be due to the dynamic shift of the senior-junior doctor ratio, in recent years, as most of the junior doctors being in the transition phase of their career. World-over this silent loss of expert clinicians, mentors, and trainers, has significantly affected the quality of patient care and skill transfer of trainees. Across specialties this loss of support framework is postulated to add pressure on clinicians, leading to more burn-out, and increasing adverse events.^{44,45}

In a cross-sectional study from Tanzania, more than 40% of women who underwent hysterectomy had complications within 10 days of surgery. The common

Table 7**Distribution of Mean Duration of Hospital Stay**

Duration (days)	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Abdominal hysterectomies	8.7	8.7	7.8	7.9	7.7	7.9	7.1	6.9	6.3	6.5
Vaginal hysterectomies	6.8	6.8	5.9	6.2	6	6	5.4	5.8	4.9	5.1
Laparoscopic hysterectomies	6.1	6.1	4.8	5.1	5.2	4.9	4.8	5.4	4.7	5.2

Table 8**Distribution of Histopathological Correlation with Hysterectomy**

Diagnosis	2012		2013		2014		2015		2016		2017		2018		2019		2020		2021	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Same diagnosis	333	63.4	268	64.7	325	69.0	339	67.0	338	69.8	371	66.0	406	68.0	381	68.1	183	91.0	403	91.4
Additional diagnosis	101	19.2	78	18.8	97	20.6	106	21.0	97	20.0	154	27.3	154	25.8	154	27.5	17	8.5	22	5.0
New diagnosis	85	16.2	64	15.5	45	9.6	57	11.2	45	9.4	32	5.8	32	5.3	27	4.8	1	0.5	16	3.6
No abnormality found	6	1.1	4	1.0	4	0.8	4	0.8	4	0.8	5	0.9	5	0.9	0	0.0	0	0.0	0	0.0
Total	525	100.0	414	100.0	471	100.0	506	100.0	484	100.0	562	100.0	597	100.0	559	100.0	201	100.0	441	100.0

complications in their cohort included hemorrhage, need of transfusion, anemia, and postoperative fever.²⁹ A population-based cohort study from the Danish hysterectomy database reported an overall incidence of major complications in 7% and minor complications in 9.4% of hysterectomies over a 10-year period from 2004 to 2015.³ Following this another study was published from the same Danish database, wherein they reported a 50% reduction in the incidence of complications, after reducing the proportion of abdominal hysterectomies and increasing laparoscopic hysterectomies. With 85% of their cases carried out laparoscopically the incidence of major and minor complications was reduced to 4.1% and 5.7%, respectively.⁴⁶ Mortality following hysterectomy has been less than 0.5% in our setup. In the Danish database, it was reported to be 0.27%.⁴⁶

This discrepancy in complication rate among various reports is owing to the fact that there is no uniform system of documenting surgical complications. It has been acknowledged that surgical complications are difficult to classify which impairs the comparison between centers. In 2004, Clavien and Dindo validated a classification system for surgical complications in five grades, based on the treatment intervention. This approach permits to identify all the events that could affect the morbidity and mortality of the patients in an organized way for international comparisons.⁴⁷ A recent study used the Clavien and Dindo classification to report intraoperative complications and reoperations of hysterectomy in the context of elective surgery.⁴⁸ Their findings provide clear and orderly data related to the risks of elective hysterectomy. Not only is it useful to preoperatively identify the risks and to provide detailed information during the informed consent for each hysterectomy group, it is also important to compare the rate of complications between different studies.

On the histopathological correlation of the specimen obtained, we did not find any case of unexpected malignancy. A recent study found unexpected gynaecological malignancy in 38 of 6648 cases who underwent hysterectomy for benign indications, yielding an incidence rate of 0.58%. They reported 20 cases (0.31%) with endometrial cancer, eight cases (0.12%) with uterine sarcoma, seven cases (0.10%) with ovarian cancer, one case (0.01%) with tubal cancer, and two (0.03%) with cervical cancer.⁴⁹ This emphasizes the need of adequate screening for cancers and proper evaluation of every patient before posting them for hysterectomy.

In conclusion, we report a static trend in hysterectomy over the past 10 years, despite the reports of changing trends in

frequency, route, and indications of hysterectomy for benign conditions, worldwide. This audit provides insight for the need of shifting the abdominal to the vaginal route, in carefully chosen patients. This will be beneficial for the patients, and for the trainees, where they can learn under supervision. Availability and patient education about the nonsurgical management options for benign gynecological conditions, as well as awareness about sequelae of hysterectomy, will bring down the rate of hysterectomy in countries such as India.

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