

Surgical Treatment of Uterine Leiomyomas from 2016-2022 in the Republic of Kazakhstan

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Abstract

Background: Due to the transition to a mandatory health insurance system (MHIS) and also taking into account the impact of the COVID-19 pandemic, the purpose of this study was to evaluate the surgical treatment of uterine leiomyoma in Kazakhstan in recent years, taking into account the ratio of uterine-preserving surgery (UPS) and hysterectomy.

Methods and Results: This epidemiological study was carried out upon the request of the Republican E-Health Center (RCEZ) to assess the dynamics of surgical treatment of uterine leiomyomas (UL) in Almaty at the expense of the Republican budget from 2016 to 2022. Since 2016, by 2022 there was a decrease in the total number of treated cases of UL at the expense of the Republican budget (from 1,478 to 1,063). From 2016 to 2019, there were statistically significantly more hysterectomies, whereas from 2020 to 2022 the number of uterine-preserving surgeries increased statistically significantly. The number of laparoscopic myomectomy and hysteroscopic myomectomy for treating submucous leiomyomas increased statistically significantly from 2016 to 2019. However, there were no statistical differences in the number of treated cases with this technique from 2020 to 2022.

Conclusion: Although high-tech fibroid surgery has been performed more frequently in recent years, these numbers are insufficient today, which justifies the need to train more specialists in advanced technologies. (**International Journal of Biomedicine. 2024;14(1):118-121.**)

Keywords: uterine leiomyomas • myomectomy • uterine-preserving surgery

For citation: Barmanasheva ZE, Dzhakupov DV, Kudaibergenov TK, Laktionova MV. Surgical Treatment of Uterine Leiomyomas from 2016-2022 in the Republic of Kazakhstan. International Journal of Biomedicine. 2024;14(1):118-121. doi:10.21103/Article14(1)_OA18

Abbreviations

HM, hysteroscopic myomectomy; **LM**, laparoscopic myomectomy; **MHIS**, mandatory health insurance system; **SL**, submucous leiomyomas; **UL**, uterine leiomyomas; **UPS**, uterine-preserving surgery.

Introduction

Due to the high prevalence of submucous leiomyoma (SL) of the uterus, myomectomy is one of the most frequent operations in the structure of gynecological surgery.^(1,2) Today, there is a tendency in the world to seek uterine-preserving surgery (UPS) in the absence of cancer risks for women not only of reproductive age.⁽¹⁻³⁾ Laparoscopic access with

temporary occlusion of the uterine arteries is the method of choice with promising results in efficacy, safety, reduction of recurrence, and fertility preservation.⁽⁴⁻⁷⁾

Since 2020, the Republic of Kazakhstan has introduced an MHIS (mandatory health insurance system) where uterine leiomyomas (UL) are also treated. During the COVID-19 pandemic, the number of planned hospitalizations for surgical treatment was forced to decrease. The limited budget allocated from the Republican budget for treatment under MHIS and the pandemic impacted the number of planned hospitalizations; today, this procedure is often performed at the expense of fee-based medical services. We consider it important to assess

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the dynamics of surgical treatment of UL at the expense of the Republican budget in recent years, especially the ratio of UPS and hysterectomy, to assess the level of health-services delivery for women with UL. This information is of great importance for understanding the development of a further strategy to improve the effectiveness of health-services delivery.

Materials and Methods

This epidemiological study was carried out upon the request of the Republican E-Health Center (RCEZ). This study aimed to assess the dynamics of surgical treatment of UL in Almaty at the expense of the Republican budget from 2016 to 2022.

Inclusion criteria were surgical treatment cases in inpatient care facilities in Almaty according to the following ICD-10 codes: D25.0 Submucous leiomyoma of uterus, D25.1 Intramural leiomyoma of uterus, D25.2 Subserous leiomyoma of uterus, for the period from 2016 to 2022.

Exclusion criteria were the period up to 2016, surgical treatment of UL in other cities of the Republic of Kazakhstan, and nonsurgical treatment of UL.

Statistical analysis was performed using the statistical software package SPSS version 26.0 (SPSS Inc, Armonk, NY: IBM Corp). Baseline characteristics were summarized as frequencies and percentages. Group comparisons were performed using Pearson's chi-squared test, and the strength of the relationship between the features (effect size) was assessed through the evaluation of Cramer's V values. *P*-values less than 0.05 were considered significant.

Results

According to the data obtained from the RCEP, there was a decrease in the total number of treated UL cases at the expense of the Republican budget (Table 1). There was also a decrease in cases of SL treatment, which was statistically significant when comparing the number of cases in 2022 with 2016, 2017, and 2018 ($P_{(16-22)} < 0.001$ (V=0.196, weak), $P_{(17-22)} < 0.001$ (V=0.215, medium), $P_{(18-22)} < 0.001$ (V=0.173, weak)), as well as when comparing the number of cases in 2021 with 2016, 2017, and 2018 ($P_{(16-21)} < 0.001$ (V=0.098, insignificant), $P_{(17-21)} < 0.001$ (V=0.262, medium), $P_{(18-21)} < 0.001$ (V=0.221, medium)) (Table 1). When pairwise comparing cases of SL from other years, no statistically significant differences were found.

From 2016 to 2018, there were no statistically significant dynamics of hysterectomy. Starting in 2019, there was a statistically significant decrease in hysterectomy numbers until 2021; however, in 2022, there was again a statistically significant increase in the number of hysterectomies compared to 2021; nevertheless, in 2022, the number of hysterectomies was significantly less than in other years ($P_{(16-22)} < 0.001$ (V=0.154, weak), $P_{(17-22)} < 0.001$ (V=0.192, weak), $P_{(18-22)} < 0.001$ (V=0.218, medium), $P_{(19-22)} < 0.001$ (V=0.079, insignificant), $P_{(20-22)} = 0.007$ (V=0.056, insignificant), $P_{(21-22)} < 0.001$ (V=0.149, weak), $P_{(16-21)} < 0.001$ (V=0.297, medium), $P_{(17-21)} < 0.001$ (V=0.262, medium), $P_{(18-21)} < 0.001$ (V=0.335,

medium), $P_{(19-21)} < 0.001$ (V=0.306, medium), $P_{(20-21)} = 0.016$ (V=0.204, medium), $P_{(18-22)} < 0.001$ (V=0.218, medium), $P_{(16-20)} < 0.001$ (V=0.100, weak), $P_{(17-20)} < 0.001$ (V=0.138, weak), $P_{(18-20)} < 0.001$ (V=0.165, weak), $P_{(19-20)} < 0.001$ (V=0.106, weak), $P_{(19-18)} = 0.003$ (V=0.06, insignificant), $P_{(19-18)} = 0.003$ (V=0.06, insignificant)) (Table 1).

The number of laparoscopic myomectomy (LM) and hysteroscopic myomectomy (HM), minimally invasive surgical procedures for treating SL, increased statistically significantly when pairwise comparing all cases overall years; however, there were no statistical differences in the number of treated cases using these techniques from 2020 to 2022 ($P_{(19-22)} < 0.001$ (V=0.240, medium), $P_{(18-22)} < 0.001$ (V = 0.282, medium), $P_{(17-22)} < 0.001$ (V=0.363, medium), $P_{(16-22)} < 0.001$ (V=0.371, medium), $P_{(19-21)} < 0.001$ (V=0.241, medium), $P_{(18-22)} < 0.001$ (V=0.283, medium), $P_{(17-22)} < 0.001$ (V=0.362, medium), $P_{(16-22)} < 0.001$ (V=0.364, medium), $P_{(19-20)} < 0.001$ (V=0.209, medium), $P_{(18-20)} < 0.001$ (V=0.227, medium), $P_{(17-20)} < 0.001$ (V=0.308, medium), $P_{(16-20)} < 0.001$ (V=0.316, medium), $P_{(16-18)} < 0.001$ (V=0.089, insignificant), $P_{(17-18)} < 0.001$ (V=0.099, insignificant), $P_{(16-19)} < 0.001$ (V=0.110, weak), $P_{(17-19)} < 0.001$ (V=0.112, weak)) (Table 1).

As for other UPS, their number decreased statistically significantly in 2022, compared to previous years. In 2016, the number of other UPS was statistically significantly higher than in other years; there were no statistically significant differences by years from 2017 to 2021 ($P_{(21-22)} < 0.001$ (V=0.141, weak), $P_{(20-22)} = 0.013$ (V=0.050, insignificant), $P_{(19-22)} = 0.034$ (V=0.044, insignificant), $P_{(17-22)} < 0.001$ (V=0.093, insignificant), $P_{(16-22)} < 0.001$ (V=0.134, weak), $P_{(16-17)} = 0.038$ (V=0.039, insignificant), $P_{(16-18)} < 0.001$ (V=0.120, weak), $P_{(16-19)} < 0.001$ (V=0.089, insignificant), $P_{(16-20)} < 0.001$ (V=0.138, weak)) (Table 1).

When comparing the number of hysterectomies and UPS for each year, it was found that from 2016 to 2019, there were statistically significantly more hysterectomies. In contrast, from 2020 to 2022, UPS increased statistically significantly (2016: $P < 0.001$ (V=0.072, insignificant); 2017: $P < 0.001$ (V=0.147, weak); 2018: $P < 0.001$ (V=0.201, medium); 2019: $P < 0.001$ (V=0.082, insignificant); 2020: $P < 0.001$ (V=0.129, weak); 2021: $P < 0.001$ (V=0.516, relatively strong); 2022: $P < 0.001$ (V=0.240, medium)) (Table 1). When comparing LM or HM for treating SL with other organ-preserving techniques, other techniques were statistically significantly more often performed until 2019. From 2020 to 2021, other UPS were performed more often without statistical differences. In 2022, LM or HM for treating SL was performed more often than other UPS, but no statistical differences were found (2016: $P < 0.001$ (V=0.752, strong); 2017: $P < 0.001$ (V=0.738, strong); 2018: $P < 0.001$ (V=0.469, relatively strong); 2019: $P < 0.001$ (V=0.408, relatively strong)) (Table 1).

Discussion

Since 2016, by 2022 there was a decrease in the total number of treated cases of UL at the expense of the Republican budget (from 1,478 to 1,063), which is associated with the transition to MHIS and with the period of the COVID-19 pandemic, when the number of planned operations had to be reduced due to quarantine.

Table 1.

Surgical treatment of UL at the expense of Mandatory Social Health Insurance (MSHI) funds in Almaty (2016–2022).

Treated cases	Period						
	2016	2017	2018	2019	2020	2021	2022
Total treated cases	1478	1322	1271	1251	1295	1174	1063
SL	629 (42.5%)	585 (44.3%)	507 (39.9%)	317 (25.3%)	369 (28.5%)	230 (19.6%)	251 (23.6%)
<i>P</i> -value	$P_{(16-22)} < 0.001$ (V=0.196, weak); $P_{(17-22)} < 0.001$ (V=0.215, medium); $P_{(18-22)} < 0.001$ (V=0.173, weak); $P_{(16-21)} < 0.001$ (V=0.098, insignificant); $P_{(17-21)} < 0.001$ (V=0.262, medium); $P_{(18-21)} < 0.001$ (V=0.221, medium)						
Hysterectomy	792 (53.6%)	758 (57.3%)	763 (60.03%)	677 (54.1%)	564 (43.5%)	284 (28.1%)	404 (38%)
<i>P</i> -value	$P_{(16-22)} < 0.001$ (V=0.154, weak); $P_{(17-22)} < 0.001$ (V=0.192, weak); $P_{(18-22)} < 0.001$ (V=0.218, medium); $P_{(19-22)} < 0.001$ (V=0.079, insignificant); $P_{(20-22)} = 0.007$ (V=0.056, insignificant); $P_{(21-22)} < 0.001$ (V=0.149, weak); $P_{(16-21)} < 0.001$ (V=0.297, medium); $P_{(17-21)} < 0.001$ (V=0.262, medium); $P_{(18-21)} < 0.001$ (V=0.335, medium); $P_{(19-21)} < 0.001$ (V=0.306, medium); $P_{(20-21)} = 0.016$ (V=0.204, medium); $P_{(18-22)} < 0.001$ (V=0.218, medium); $P_{(16-20)} < 0.001$ (V=0.100, weak); $P_{(17-20)} < 0.001$ (V=0.138, weak); $P_{(18-20)} < 0.001$ (V=0.165, weak); $P_{(19-20)} < 0.001$ (V=0.106, weak); $P_{(19-18)} = 0.003$ (V=0.06, insignificant); $P_{(18-18)} = 0.003$ (V=0.06, insignificant).						
Total UPS	686 (46.4%)	564 (42.7%)	508 (39.97%)	574 (45.9%)	731 (56.5%)	890 (71.9%)	659 (62%)
<i>P</i> -value (Hysterectomy vs. UPS)	2016: $P < 0.001$ (V=0.072, insignificant); 2017: $P < 0.001$ (V=0.147, weak); 2018: $P < 0.001$ (V=0.201, medium); 2019: $P < 0.001$ (V=0.082, insignificant); 2020: $P < 0.001$ (V=0.129, weak); 2021: $P < 0.001$ (V=0.516, relatively strong); 2022: $P < 0.001$ (V=0.240, medium).						
Other UPS	601 (40.7%)	490 (37.1%)	373 (29.3%)	404 (32.3%)	359 (27.7%)	490 (41.7%)	300 (28.2%)
<i>P</i> -value	$P_{(21-22)} < 0.001$ (V=0.141, weak); $P_{(20-22)} = 0.013$ (V=0.050, insignificant); $P_{(19-22)} = 0.034$ (V=0.044, insignificant); $P_{(17-22)} < 0.001$ (V=0.093, insignificant); $P_{(16-22)} < 0.001$ (V=0.134, weak); $P_{(16-17)} = 0.038$ (V=0.039, insignificant); $P_{(16-18)} < 0.001$ (V=0.120, weak); $P_{(16-19)} < 0.001$ (V=0.089, insignificant); $P_{(16-20)} < 0.001$ (V=0.138, weak).						
LM or HM for treating SL	85 (5.7%)	74 (5.6%)	135 (10.6%)	170 (13.6%)	372 (28.7%)	400 (34.1%)	359 (33.8%)
<i>P</i> -value	$P_{(19-22)} < 0.001$ (V=0.240, medium); $P_{(18-22)} < 0.001$ (V=0.282, medium); $P_{(17-22)} < 0.001$ (V=0.363, medium); $P_{(16-22)} < 0.001$ (V=0.371, medium); $P_{(19-21)} < 0.001$ (V=0.241, medium); $P_{(18-22)} < 0.001$ (V=0.283, medium); $P_{(17-22)} < 0.001$ (V=0.362, medium); $P_{(16-22)} < 0.001$ (V=0.364, medium); $P_{(19-20)} < 0.001$ (V=0.209, medium); $P_{(18-20)} < 0.001$ (V=0.227, medium); $P_{(17-20)} < 0.001$ (V=0.308, medium); $P_{(16-20)} < 0.001$ (V=0.316, medium); $P_{(16-18)} < 0.001$ (V=0.089, insignificant); $P_{(17-18)} < 0.001$ (V=0.099, insignificant); $P_{(16-19)} < 0.001$ (V=0.110, weak); $P_{(17-19)} < 0.001$ (V=0.112, weak).						
<i>P</i> -value (LM or HM vs. other organ-preserving techniques)	2016: $P < 0.001$ (V=0.752, strong); 2017: $P < 0.001$ (V=0.738, strong); 2018: $P < 0.001$ (V=0.469, relatively strong); 2019: $P < 0.001$ (V=0.408, relatively strong)						

Surgical treatment of UL according to the mentioned ICD-10 codes (D25.0 Submucous leiomyoma of the uterus; D25.1 Intramural leiomyoma of the uterus; D25.2 Subserous leiomyoma of uterus) was carried out at the expense of MHSI funds. As a rule, a certain amount is allocated for the organization at the beginning of the year and distributed for each month, so it is not possible to perform operations more than the amount issued; therefore, in recent years, this type of surgical treatment has been carried out at the expense of fee-based medical services, either at the expense of the guaranteed volume of free medical care (GVFMC) funds, in the presence of concurrent endometriosis, or bleeding. By 2022, the number of SL cases had decreased from 629 cases per year in

2016 to 251 in 2022, which may also be because the bleeding occurs more often at submucous locations, and assistance is provided at the expense of GVFMC funds, as well as based on fee-based medical services.

Our analysis showed that the number of all UPSs did not change much in dynamics; however, when comparing the number of hysterectomies and UPSs for each year, it was found that from 2016 to 2019, there were statistically significantly more hysterectomies, whereas from 2020 to 2022 the number of UPSs increased statistically significantly.

This trend is positive since today the ability to preserve an organ is a priority in gynecology, even for women who have performed a reproductive function or are in the menopausal

period; this is positive from the position of better blood supply to the ovaries in cases where it is possible to preserve them and preserve the integrity of the connective tissue structures of the pelvis, blood vessels, and nerves.

However, these results should be treated with caution since radical operations with concomitant uterine fibroids can be performed at the expense of GVFC funds and encoded according to another basic code, which limits the opportunity for objective assessment.

Thus, there is also a positive trend in using high-tech techniques; the number of laparoscopic myomectomy and hysteroscopic myomectomy for treating submucous leiomyomas increased statistically significantly from 2016 to 2019. However, there were no statistical differences in the number of treated cases with this technique from 2020 to 2022. Although high-tech fibroid surgery has been performed more frequently in recent years, these numbers are insufficient today, which justifies the need to train more specialists in advanced technologies.

Competing Interests

The authors declare that they have no competing interests.

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