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Relationship between menarche age and parity with the incidence of uterine myoma

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ABSTRACT

Background: Uterine myomas, or fibroids, are one of the most common benign tumors that occur in women of reproductive age, with a reasonably high prevalence worldwide. However, rarely, potentially malignant uterine myomas can cause a variety of health problems, including excessive menstruation, pelvic pain, fertility disorders, and pregnancy complications.

Objective: This study aims to analyze the relationship between menarche age and parity with the incidence of uterine myoma.

Methods: Types and design of research the plan used in this exploration is quantitative exploration with a case control approach. Sampel berjumlah 138 responden masing-masing 102 ibu yang mengalami mioma uteri dan 36 ibu yang tidak mengalami efek buruk mioma uteri.

Results: The test results measured using the chi-square test were obtained with p-value menarche age = 0.004 and parity p-value = 0.000, meaning there was a very large relationship between menarche age and parity with the incidence of uterine myomas.

Conclusion: It can be concluded that the earlier the age of menarche increases the risk of uterine myoma later in life. In contrast, slower menarche may be associated with a reduced risk of myomas. Other factors such as genetic, environmental, and lifestyle factors also influence the incidence of uterine myomas, but menarche age is one of the significant hormonal indicators of risk.

Keywords: lifestyle, menarche, age, parity, uterine myoma.

INTRODUCTION

Uterine fibroids, also known as fibroids, are benign tumors that develop in the smooth muscles of the uterus and are one of the most common gynecological conditions experienced by women of reproductive age (Santulli *et al.*, 2024). The incidence of uterine myoma can be affected by various factors, both genetic and hormonal. Two hormonal factors often associated with uterine myoma development are menarche age and parity (number of live births). Uterine fibroids, or fibroids, are benign tumors that develop in the smooth muscles of the uterus and are often found in women of reproductive age (Farooq *et al.*, 2024). This condition is one of the most common gynecological health problems, with a reasonably high prevalence worldwide. Although it is non-cancerous, uterine myomas can cause various symptoms, such as excessive menstrual bleeding, pelvic pain, fertility disorders, and pregnancy complications (Pandey *et al.*, 2024). Therefore, uterine myomas have a significant impact on the quality of life of women who experience them. Uterine myomas are benign tumors that mostly occur in women of childbearing age, with a frequency ranging from 20 to 25%. Symptoms are increased menstrual flow, pain, and signs of pressure. New treatments have been proposed, including uterine artery embolization (Petersdorf *et al.*, 2022).

One of the hormonal factors that is thought to affect the development of uterine myoma is menarche age, which is the age when a woman experiences her first menstruation (Charifson *et al.*, 2022). An earlier age of menarche is considered to increase the risk of uterine myoma because women with early menarche experience exposure to the hormone estrogen for a more extended period of time (Agbayani Cruz and Bucu, 2024). Estrogen is one of the main hormones that affect the growth of myomas, so the longer the exposure to this hormone, the more likely a woman is to develop myomas later in life. In contrast, slower menarche may be associated with lower risk due to shorter estrogen exposure (Farkas, Abumusa and Rossiter, 2023). An important hormonal factor that affects the risk of uterine myoma is menarche age, which is the age when a woman first experiences menstruation. Earlier menarche age indicates a longer exposure to estrogen throughout a woman's reproductive life (H. Zhang *et al.*, 2024). Estrogen is known as a hormone that can trigger the growth of smooth muscle tissue in the uterus, so early menarche has the potential to increase the risk of uterine myomas. In contrast, slower menarche tends to be associated with lower risk due to shorter exposure to the hormone estrogen (Yuliyanti, Kristiarini and Suryantara, 2024).

Menarche age, which is the age when a woman first experiences menstruation, plays an important role in hormonal exposure throughout reproductive life (Kwinten *et al.*, 2023). Earlier menarche is associated with longer exposure to estrogen, which is known to be a significant risk factor for the development of uterine myomas. Prolonged exposure to estrogen can stimulate the growth of smooth muscle cells in the uterine wall, thereby increasing the risk of myoma formation (Sun *et al.*, 2023). In addition to menarche age, parity or the number of live births experienced by a woman also plays an important role in the risk of uterine myomas. Research shows that women with more live births have a lower risk of developing myomas (Dolmans *et al.*, 2024). Pregnancy is known to reduce estrogen exposure, so women with higher parity have a reduced risk of uterine myoma due to reduced exposure to this hormone during pregnancy. In contrast, slower menarche may lower the risk due to shorter hormonal exposure. Parity, or the number of live births a woman experiences, is also important in the incidence of uterine myomas (Hafid, Rodiani and Sayuti, 2023).

Parity, or the number of live births a woman experiences, is also associated with the risk of uterine myomas. Research shows that women with higher parity have a lower risk of developing myomas (Hill and Shetty, 2023). This may be due to hormonal influences during pregnancy, where estrogen levels decrease and progesterone increases, which helps protect the uterus from the development of myomas. Women with more children tend to have a lower risk of developing myomas (Kim *et al.*, 2023). This is most likely due to decreased estrogen exposure during

pregnancy, when hormone progesterone levels are more dominant and estrogen is reduced (Yin *et al.*, 2023). Therefore, women who become pregnant more often have a shorter time of exposure to estrogen, which can lower the risk of myomas. Considering the important role of menarche age and parity, understanding the relationship between these two factors and the incidence of uterine myomas is important in preventing and managing this condition (Wojtyła *et al.*, 2023). The mechanism behind this relationship is to develop better strategies for preventing and treating uterine myomas. This study aims to analyze the relationship between menarche age and parity with the incidence of uterine myomas, given the importance of these two factors in understanding the hormonal risks that can affect women's reproductive health.

RESEARCH METHODOLOGY

Types and design of research. The plan used in this exploration is Quantitative Exploration with a case-control approach, which reviews or investigates the relationship between two factors in an emotional collection of circumstances through review: population and Sample. The population in this study is all women with reproductive system disorders who were treated at Tenriawaru Bone Hospital, South Sulawesi Region, in 2021-2022, totaling 138 examples. Examples in this study are 102 mothers who experience uterine myoma and 36 mothers who do not experience adverse effects of uterine myoma. Data processing The type of information used in this exploration is supporting information in the form of medical records in 2022 at medical record institutions. The information obtained will be investigated univariate and bivariate using the Chi-Square measured test with a certainty level of 95% ($\alpha = 0.05$). Using the chi-square test, bivariate investigations were conducted to test the relationship between dependent and autonomous variables.

RESULT

Table 1. Distribution of the incidence frequency of uterine myoma, menarche age, and parity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Myoma uteri**	102	73,9	73,9	73,9
	Not experiencing Mioma uteri	36	26,1	26,1	100,0
	Total	138	100,0	100,0	
Menarche Age					
Valid	High Risk <12 - >14	108	78,3	78,3	78,3
	Low Risk 12 – 14	30	21,7	21,7	100,0
	Total	138	100,0	100,0	
Paritas					
Valid	High Risk >2	110	79,7	79,7	79,7
	Low risk <2	28	20,3	20,3	100,0
	Total	138	100,0	100,0	

Based on the table, the problem of adjustment of the conception framework, of the 138 cases of regenerative framework problems, the highest is in the situation of the regenerative framework that has uterine myoma, which is 102 respondents (73.9%) and the least in mothers who do not experience uterine myoma as many as 36 respondents (26.1%). However, they experience conceptual framework problems such as harmless ovarian (ovary) neoplasms and harmless urinary tract organ neoplasms. The risk of menarche was high (<12->43), 108 (78.3%) were in the low-risk condition of menarche (12-14) and 30 (21.7%). The parity that experienced high risk (>2) was 110 (79.9%), and the parity was low risk (<2) as many as 28 (20.3%).

Table 3. Menarche age bivariate analysis, parity with the incidence of uterine myoma

			Menarche Age		Total
			High Risk	Low Risk	
Myoma uteri	Mioma uteri	Count	86	16	102
		Expected Count	79,8	22,2	102,0
	Not having uterine myoma.	Count	22	14	36
		Expected Count	28,2	7,8	36,0
Total		Count	108	30	138
		Expected Count	108,0	30,0	138,0

			Prices		Total
			High Risk	Low Risk	High Risk
Myoma uteri	Mioma uteri	Count	89	13	102
		Expected Count	81,3	20,7	102,0
	Not having uterine myoma.	Count	21	15	36
		Expected Count	28,7	7,3	36,0
Total		Count	110	28	138
		Expected Count	110,0	28,0	138,0

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	8,420(b)	1	,004		
Continuity Correction(a)	7,111	1	,008		
Likelihood Ratio	7,772	1	,005		
Fisher's Exact Test				,008	,005
Linear-by-Linear Association	8,359	1	,004		
N of Valid Cases	138				
Pearson Chi-Square	8,420(b)	1	,004		
Continuity Correction(a)	7,111	1	,008		
Likelihood Ratio	7,772	1	,005		
Fisher's Exact Test				,008	,005
Linear-by-Linear Association	8,359	1	,004		
N of Valid Cases	138				

The table above provides an overview of the side effects of examining the relationship between menarche time and the incidence rate of uterine myomas. It is known that of respondents who experience uterine myoma, there are 108 (78.3%) respondents of menarche age who are at a high level (<12->14), and 30 (21.7%) respondents of menarche age who are in a low condition in general (12-14). The results of the measured test using the Chi-Square Test were obtained with

p-value = 0.004, meaning there was a critical relationship between the time of menarche and the incidence of uterine myomas. It is known that among the respondents who experienced uterine myoma, there were 110 (79.7%) respondents with high parity (>2) and 28 (20.3%) with low-risk parity (<2). The test results were measured using the Chi-Square Test. They obtained a p-value = 0.000, meaning there was a very large relationship between the age of menarche and the incidence of uterine myomas.

The relationship between menarche time and age and the incidence of uterine myomas has been a concern in medical research. Earlier menarche may be associated with more prolonged exposure to estrogen during the reproductive period, which is thought to be a major risk factor for the development of uterine myomas. Longer exposure to the hormone estrogen increases the chances of the growth of smooth muscle tissue in the uterus, which can then develop into myomas. The results of the study showed that an earlier age of menarche increased the risk of uterine myomas later in life. In contrast, slower menarche may be associated with a reduced risk of myomas. Other factors such as genetic, environmental, and lifestyle factors also influence the incidence of uterine myoma, but menarche age is one of the significant hormonal indicators of the risk.

DISCUSSION

The results of the study showed that an earlier age of menarche increased the risk of uterine myomas later in life. In contrast, slower menarche may be associated with a reduced risk of myomas. Other factors such as genetic, environmental, and lifestyle factors also influence the incidence of uterine myomas, but menarche age is one of the significant hormonal indicators of the risk. Earlier menarche age has indeed been associated with an increased risk of uterine myomas later in life. The earlier age of menarche prolongs the duration of exposure to the hormone estrogen, which is known to be one of the factors that affect the growth of uterine myomas. In contrast, a slower menarche can reduce the duration of estrogen exposure, thereby lowering the risk of developing uterine myomas. In addition to menarche age, various other factors such as genetics, environment, and lifestyle also affect the incidence of uterine myomas. For example, a family history of uterine myoma, diet, obesity, and other reproductive factors may play a role in magnifying the risk. Although hormonal factors such as menarche age play an important role, it is important to remember that uterine myomas result from a complex combination of factors (Zhou *et al.*, 2024).

Earlier menarche age is indeed associated with an increased risk, as women who experience early menarche have longer exposure to estrogen, which is a major factor in myoma growth. In contrast, slower menarche tends to lower the risk because hormonal exposure is shorter (Roberts *et al.*, 2020). Genetic, environmental, and lifestyle factors affect the risk of developing myomas. These factors interact with the individual's hormonal condition, so although menarche age is an important factor, many other variables play a role in the development of uterine myoma. Parity as the group of nulliparous women and the group of women with more than four deliveries stand out with an increase in the incidence of myomas, a non-linear correlation seems to exist, requiring a more in-depth discussion concerning age dependence. An earlier age of menarche has been shown to increase the risk of uterine myomas. Earlier menarche is associated with a longer duration of estrogen exposure during the reproductive period. Estrogen has a proliferative effect on the smooth muscle tissue of the uterus, which can lead to the growth of myomas. Prolonged exposure to estrogen promotes the growth of smooth muscle cells, which increases the likelihood of myoma forming (Dolmans and Donnez, 2024).

Parity has a significant influence on the incidence of uterine myomas. Women who have high parity show a lower risk of developing myomas. This may be due to hormonal influences during pregnancy, where estrogen levels decrease and progesterone increases (Coutinho *et al.*, 2022). During pregnancy, high estrogen levels lead to tissue growth, but after childbirth, the hormonal changes that occur can reduce the risk of developing myomas. Therefore, women who have more children tend to have shorter periods of estrogen exposure, thereby reducing the risk of myomas. Although menarche age and parity are important, genetic, environmental, and

lifestyle factors influence uterine myomas. For example, genetic factors can increase a person's predisposition to myomas, while environmental factors such as diet, obesity, and exposure to chemicals can also contribute to the risk. A healthy lifestyle, including a balanced diet and adequate physical activity, can help reduce the risk of myomas (Li *et al.*, 2024).

Menarche age and parity have a significant relationship with the incidence of uterine myomas. This knowledge can be the basis for better prevention strategies and improved understanding of risk factors affecting women's reproductive health (Song *et al.*, 2023). Further research is needed to explore the interaction between these factors and their impact on the incidence of uterine myomas. Earlier menarche age allows for a longer accumulation of estrogen during the reproductive period, which is known to affect the proliferation of cells in the uterine wall. This increase in estrogen levels can accelerate the growth of myomas, so women with early menarche age are at higher risk of developing complications related to uterine myomas. Menarche age and parity have a significant relationship with the incidence of uterine myomas. The results of the analysis showed that the earlier age of menarche was associated with an increased risk of developing uterine myomas. This is in line with many previous studies that have shown that longer exposure to estrogen due to premature menarche contributes to the growth of smooth muscle cells in the uterus, which can lead to the development of myomas (J. Zhang *et al.*, 2024).

Parity has been shown to have a protective impact on the incidence of myomas. Women who have more children have a reduced risk of uterine myomas, likely due to hormonal fluctuations that occur during pregnancy. During pregnancy, estrogen levels tend to decrease while progesterone increases, inhibiting myomas' growth (Rault *et al.*, 2020). This suggests that the hormonal factors associated with pregnancy have opposite effects on the growth of uterine myomas. In addition to hormonal factors, other factors can affect the incidence of myomas, such as genetics, environment, and lifestyle. Research shows that a family history of uterine fibroids can increase the risk, and environmental factors such as exposure to certain chemicals and diet also play a role. Therefore, it is important to consider the complex interactions between these various risk factors when analyzing the incidence of uterine myomas. Parity also has an important role in the incidence of uterine myomas. Women who have more children (high parity) tend to have a lower risk of developing myomas. During pregnancy, significant hormonal changes occur; Estrogen levels decrease while progesterone increases. These changes can affect the uterus's environment and inhibit myomas' growth (Mension *et al.*, 2024).

Women who experience menarche at an earlier age have a higher risk of developing uterine myomas later in life. Longer exposure to estrogen due to early menarche contributes to the growth of smooth muscle cells in the uterus, increasing the likelihood of myoma (Vannuccini *et al.*, 2022). Women with higher parity tend to have a lower risk of developing uterine myomas. Hormonal fluctuations that occur during pregnancy, including decreased estrogen levels and increased progesterone, can have a protective effect on the development of myomas. Although menarche age and parity are significant hormonal indicators, other factors such as genetics, environment, and lifestyle also play an important role in the incidence of uterine myomas. Overall, this study provides important insights into the factors that affect the risk of uterine myoma and can serve as a basis for developing more effective preventive interventions. Understanding this relationship is essential in improving women's reproductive health care and reducing complications associated with uterine myomas (Pavlik, Konchekov and Shimanovskii, 2024).

Clinical Implications

The results of this study have important implications for clinical practice. Understanding the relationship between menarche age, parity, and uterine myoma risk can help in the development of prevention and education programs for women, especially those at high risk. Women who experience early menarche or have low parity need to be given more information and attention to monitor their reproductive health.

CONCLUSION

It can be concluded that there is a significant relationship between menarche age and parity with the incidence of uterine myomas. Women who experience menarche at an earlier age have a higher risk of developing uterine myomas later in life due to longer exposure to the hormone estrogen. In contrast, women with slower menarche tend to have a lower risk. In addition, parity also plays an important role in reducing the risk of uterine myomas. Women who had more children (high parity) showed a reduced risk of myomas, which are most likely caused by hormonal changes that occur during pregnancy, especially decreased estrogen exposure. Other factors such as genetics, environment, and lifestyle also affect the risk of uterine myomas, but menarche age and parity remain significant hormonal indicators. This knowledge can be used to support more effective strategies for the prevention and management of uterine myomas.

Conflict of Interest

No conflict of interest

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