ISOLATED FALLOPIAN TUBE TORSION IN 20 YEARS OLD LADY: CASE REPORT

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ABSTRACT

BACKGROUND: Isolated fallopian tube torsion is the rotation of the fallopian tube along its long axis, resulting in obliteration of blood supply while the ovary's blood supply and lymphatic drainage remain unaffected. The prevalence of isolated fallopian tube torsion is estimated to be only 1 in 1,500,000 but is believed to be rarer. Although the pathophysiology of isolated fallopian tube torsion is not well known, there are well-defined risk factors for the disease. It most commonly affects the right side of the fallopian tube rather than the left side.

CLINICAL PRESENTATION: A 20-year-old woman presented with acute severe lower abdominal pain, vomiting, and lower back pain. She had a urinary complaint of 3 days' duration.

PERTINENT FINDINGS:

PHYSICAL EXAMINATION: Vital signs: PR = 110 bpm, temp = 38°C. On abdominal examination, there was significant tenderness in the lower abdomen on deep palpation.

GENITOURINARY SYSTEM: There was no abnormal vaginal discharge. On vaginal digital examination, there was tenderness on the right side of the pelvis.

With the above-mentioned clinical presentation, pelvic inflammatory disease was considered the working diagnosis, and broad-spectrum antibiotics were started. Despite administering broad-spectrum antibiotics for 48 hours, the clinical symptoms and signs worsened. For this reason, operative laparotomy was decided. Intraoperatively, there was right-sided fallopian tube torsion. It was gangrenous, and a right-sided salpingectomy was performed. The postoperative period was smooth.

DISCUSSION: Isolated fallopian tube torsion is an extremely rare disease entity. Predisposing factors are classified as intrinsic and extrinsic. It occurs in reproductive-age groups and is a rare cause of acute abdomen in this population. This case presented with severe acute abdominal pain, vomiting, and urinary symptoms. On physical examination, the patient was febrile and had abdominal tenderness. Ultrasound showed a dilated fallopian tube and pelvic collection. These findings were nonspecific, leading to an initial diagnosis of acute pelvic inflammatory disease. Isolated fallopian tube torsion was diagnosed intraoperatively after 48 hours of antibiotic treatment for pelvic inflammatory disease, which did not respond. Diagnosis of isolated fallopian tube torsion remains challenging as it presents with vague and nonspecific clinical features. Advanced medical imaging, such as MRI, is recommended for early diagnosis and intervention.

CONCLUSION: Isolated fallopian tube torsion remains difficult to diagnose early due to nonspecific clinical presentation. Acute pelvic inflammatory disease is one of the top differential diagnoses in sexually active patients. To improve the early diagnosis of isolated fallopian tube torsion, advanced medical imaging, such as MRI, is advised. A less invasive surgical approach is the gold standard treatment. Salvaging the fallopian tube is a priority if the tube is not gangrenous.

KEYWORDS: Isolated fallopian tube torsion, pelvic inflammatory disease, acute abdomen

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INTRODUCTION

Marriage before the age of eighteen is regarded as a discriminatory practice that violates human rights and exposes women to numerous challenges[1]. Early marriage is associated with lower education levels, marital dissatisfaction, poor physical and mental health outcomes, lack of autonomy, increased gender inequality, divorce, lower social status of women, curtailed economic empowerment, limited job opportunities, and higher fertility rates[2-4]. In contrast, marriage at an older age is correlated with higher rates of female involvement in the labor force, improved mother and child health, more bargaining power, higher levels of education, and lower fertility rates[5].

Globally, the mean age at first marriage has increased. In Western countries, between 1965 and 2000, the mean age of marriage rose from 24.7 to 28.3 years[6]. Similarly, the proportion of women married before the age of 18 has declined over the past three decades, from 1 in 3 girls to 1 in 4 girls[7]. In Sub-Saharan Africa (SSA), from 1950 to 2005, the average marital age increased by 3.3 years in urban areas and 1.1 years in rural areas[8]. Despite this, the region still has a 55.11% prevalence of early marriage[9]. Similarly, in Ethiopia, the mean age at first marriage among women increased from 14.34 years in 2000 to 15.5 years in 2016[10].

Risk factors contributing to early marriage include women's education, employment opportunities, family wealth, family size, religion, rural residence, marriage decisions, media exposure, social norms, fear of pregnancy, awareness of the legal marriage age, family conflict, and virginity-associated stigma[9,11-21]. According to Sustainable Development Goal (SDG) 5.3, early marriages should cease by 2030, and Ethiopia pledged to end marriages before the age of 18 by 2025[22,23]. However, more than half (56.34%) of Ethiopian girls marry before reaching 18 years[24]. Furthermore, research has shown that rural women are more likely to marry early than their urban counterparts[18,24]. In the study area, arranged marriages are more common than love marriages, further increasing the likelihood of early marriage[25]. In Ethiopia, limited information exists about the age at first marriage among rural women. Therefore, this research aims to investigate the age at first marriage and its predictors among rural women of reproductive age.

METHODS AND MATERIALS

Study setting: This study was conducted in the West Guji Zone of southern Oromia, located 470 kilometers south of Ethiopia's capital, Addis Ababa. The zone consists of 10 administrative districts (9 rural and 1 urban) and 196 kebeles. The Guji society, an Oromo ethnic group, practices arranged marriages rather than love marriages[26].

Study Period: This study was carried out from April 1 to May 5, 2024.

Study design: A community-based cross-sectional study design.

Population: The source population included all women of reproductive age (15–49 years) living in rural districts of the West Guji Zone. The study population consisted of randomly selected women of reproductive age living in selected kebeles who were available at home during the study period. Women who were married and had resided in the selected kebeles for over six months were included, while women who were ill or in cohabiting relationships were excluded.

Sample size determination: The sample size was determined using a single population proportion formula, with the assumptions of $Z\alpha/2 = 1.96$, a 95% confidence level, a 5% margin of error, a 69.9% proportion of early marriage from a previous Ethiopian study[27], and a design effect of 2. After adding a 10% nonresponse rate, the final sample size was 711.

Sampling technique and procedure: A multistage sampling technique was adapted from previous studies[18,28]. Four of the 9 rural districts were selected randomly. Of the 96 kebeles in the selected districts, 37 kebeles were chosen based on proportional representation. After identifying households with eligible women, a sampling frame was prepared for each selected kebele. Finally, a random sampling method (random number

table) was used to select households with eligible participants. If more than one eligible woman was present in a household, a lottery method was applied (**Fig. 1**).

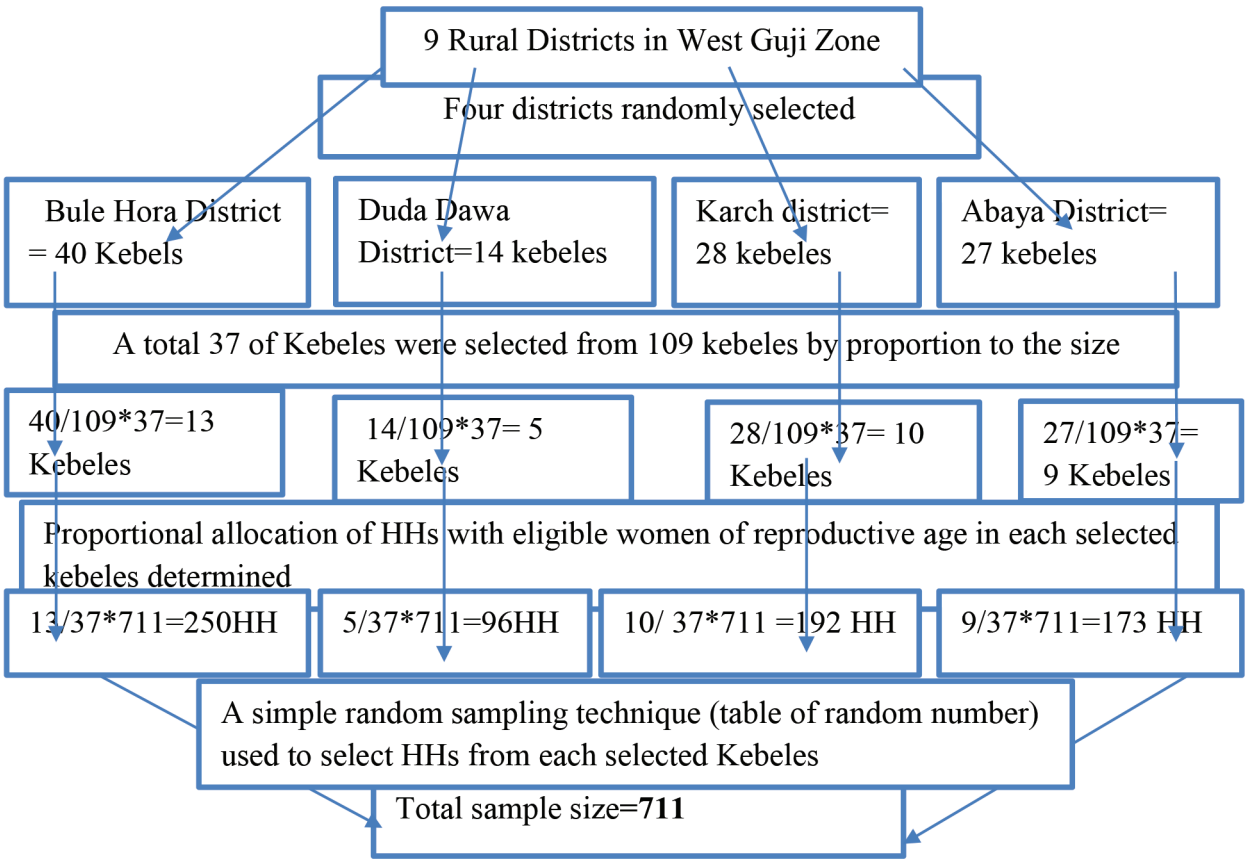

Figure 1: Pictorial presentation of the sampling procedure for the study conducted among rural reproductive-age women in the West Guji zone, Southern Ethiopia, 2024

Study variables

Dependent Variable: Female age at first marriage.

Independent Variables: Sociodemographic factors such as age, marital status, education level, and family size. Social structure and service-related factors, including media accessibility, legal punishments for early marriage offenders, and the availability of job opportunities for girls. Individual-related factors such as perceived marital age and awareness of the legal age, as well as context-related factors, such as criteria for girls reaching marriageable age, stigma related to girls' age, honor concerning virginity, family conflict, and marriage decisions.

Operational Definition: Age at first marriage is measured in years, with distribution examined using the mean[29].

Data collection tools, techniques, and quality control: The data collection instrument was adapted from relevant literature[12,18,30]. The tools were pretested in 5% (36 married women) of the study participants living in a similar setting outside the study area (Uraga district of the East Guji Zone) and administered via face-to-face interviews. Two language experts prepared the tools in English, translated them into Afan Oromo, and then

retranslated them into English for consistency. Twenty health extension workers participated in data collection, supervised by ten supervisors. The study assistants received two days of training on the instruments, data collection procedures, study objectives, confidentiality, and informed consent.

Data analysis: The data were cleaned, coded, and verified for completeness before being entered into Epi-Data version 4.4.3.1 and exported to SPSS version 25 for analysis. Descriptive statistics, including frequencies, percentages, and means, were calculated. Simple and multivariable linear regression models were used to identify predictors of age at first marriage. Variables with a significant association at $p < 0.2$ in bivariate analysis were selected for multivariable regression, with statistical significance set at $p < 0.05$.

RESULTS

Sociodemographic characteristics of the women

A total of 711 married women were interviewed in this study, making up 100% of the response rate. The mean marital age of the surveyed women was 17.5 ± (2.456 SD). The minimum and maximum ages at first marriage were 13 and 25 years, respectively. Among the interviewed women, nearly half (353, 49.6%) had an age at first marriage less than 18 years (**Table 1**).

Table 1: Sociodemographic characteristics of rural women in West Guji zone, Southern Ethiopia, 2024

Characteristics	Frequency(n)	Percent (%)
Participants age at first marriage		
<18	353	49.6
≥18	358	50.4
Participants current age		
<20	30	4.2
20-29	354	49.8
30-39	303	42.6
≥40	24	3.4
Participants marital status		
Married	682	95.9
Divorced	20	2.8
Widowed	9	1.3
Religion		
Orthodox	107	15
Muslim	147	20.7
Protestant	384	54
Waqefata	73	10.3
Father education		
Had no formal education	461	64.8
Primary(1-8)	186	26.2
Secondary (9-12)	42	5.9
College or University	22	3.1
Mother Education		
Had no formal education	616	86.6
Primary(1-8)	75	10.6
Secondary (9-12)	8	1.1
College or University	12	1.7
Participant education		
Had no formal education	251	35.3
Primary(1-8)	333	46.8
Secondary (9-12)	92	12.9
College or University	37	5
Parents family size		
1-3	17	2.4
4-6	230	32.3
≥7	464	65.3
Wealth Index		
Poor	238	33.5
Middle	237	33.4
Rich	235	33.1

Social structure and service pertaining to early marriage

The majority of the respondents (548, 77.1%) had followed media, and of those who had access to media, two-thirds listened to the radio. A remarkable number of study participants (567, 79.7%) reported the absence of girls supporting agencies in their vicinity. More than half of them (423, 59.5%) reported a lack of legal punishment against perpetrators of early marriage. The majority of surveyed women (87.9%) stated a lack of job opportunities in their locality for females.

Perceptions of the participants on early marriage

A significant number of the respondents (638, 89.7%) believed that sexual intercourse before marriage was incorrect. Similarly, more than half of the participants (365, 51.3%) mentioned that sexual intercourse before marriage led to a girl's marriage at an early age **(Table 2)**.

Table 2: Perceptions of rural women regarding early marriage in West Guji zone, Southern Ethiopia, 2024

Variables	Frequency(n)	Percent (%)
Your opinion on having sex before getting married		
Not correct	638	89.7
Correct	73	10.3
Do you believe that having sex before marriage leads to early marriage?		
No	365	51.3
Yes	346	48.7
Perceived age of marriage		
<18	126	17.7
≥18	585	82.3
Know the legal age of marriage		
No	125	17.6
Yes	586	82.4

Context-related factors of early marriage

Among the surveyed women, 638 (83.1%) reported the appearance of signs of puberty considered as a criterion for a girl reaching marriage. The majority of women (93.4%) reported that there was fear related to girls' age in the community. A total of 632 (88.9%) and 591 (83.1%) women reported that there is honor related to girls' virginity for girls as well as for girls' parents **(Table 3)**.

Table 3: Context-related factors of early marriage among rural women in the West Guji zone, Southern Ethiopia, 2024

Characteristics	Frequency (n)	Percent (%)
The criterion for girl's reached for marriage		
Signs of puberty (breast enlargement, menses)	591	83.1
Age greater than 18 years old	82	11.5
Finished school or graduate	38	5.3
The custom of girls marriage age <18 years old		
No	242	34
Yes	469	66
Reason for marriage age <18 years old		
To protect girls` virginity	158	33.7
To avoid premarital affairs	192	40.9
To strengthen inter-family relationship	45	9.6
Lack of other options for girls	74	15.8
Is there fear in your area if girls grow older?		
No	47	6.6
Yes	664	93.4
Reason for fear		
Face difficulty to marry	334	50.3
For family reputation	275	41.4
Stigma related to older age	55	8.3
Who decided your marriage?		
Not self (father, mother, relative)	241	33.9
Self	470	66.1
Honor for girls related to girls' virginity		
No	79	11.1
Yes	632	88.9
Honor for parents related to girls' virginity		
No	120	16.9
Yes	591	83.1
Conflict within family		
No	606	85.2
Yes	105	14.8

Multiple linear regression of factors associated with early marriage

A multiple linear regression model was used to determine the predictors of age at first marriage. In the multivariable forward linear regression, seven key variables were significant at $p < 0.05$: wealth status, education level of mothers, perceived age of marriage, lack of punishment against perpetrators

of early marriage, availability of job opportunities for girls, marriage decision makers, and parents' family size.

The family wealth index was a predictor of a girl's age at first marriage (β=0.922, p < 0.001). For every one-level increase in the mother's education, girls' age at first marriage increases by 0.677 years (β=0.677, p < 0.001). An increase in the perceived age of marriage increases girls' marital age by 0.357 years (β=0.357, p < 0.001). The lack of legal punishment of the perpetrators of early marriage (β= -0.600, p = 0.001). A lack of job opportunities for females (β= -0.608, p = 0.016). The age at first marriage increased by 0.254 years when girls decided to get married (β= 0.254, p = 0.013). An increase in family size by one member decreases a girl's marital age by 0.086 years (β= -0.086, p = 0.026) (**Table 4**).

Table 4: A multiple linear regression analysis for the predictors of age at first marriage among rural women in the West Guji zone, Southern Ethiopia, 2024

Predictors of age at first marriage	Unstandardized Coefficients		Standardized Coefficients	t	p-value
	B	Std. Error	Beta		
(Constant)	9.639	1.689		5.708	.000
Wealth index	.922	.102	.307	9.063	.000
Mother education	.677	.098	.233	6.916	.000
Perceived age of marriage	.357	.093	.133	3.859	.000
Lack of punishment against perpetrators	-.600	.173	-.120	-3.460	.001
No job opportunities for females	-.608	.251	-.081	-2.422	.016
Marriage decision	.254	.102	.083	2.490	.013
Parents family size	-.086	.039	-.077	-2.233	.026

DISCUSSION

In this study, the mean age at first union was 17.5 years. This means almost half of the surveyed women were married before 18 years. In the study area, the onset of secondary sexual characteristics (occurrence of menses and breast enlargement) was considered as the criteria that the girls met for marriage. These results are in line with those of previous studies carried out in Ethiopia, where the mean age of the first union was 17.2 years[11]. However, there was a slight improvement in the mean age of the first union compared with another study conducted in Ethiopia, which reported that the mean age of first marriage was 14.8 years[27]. The observed discrepancy is perhaps due to study time, the differences in the study population, sample size, and the commitment of the government interventions to eliminate violence against women, including early marriage.

The study results revealed that there was fear associated with girls' age, and the reasons for this fear were that they may face difficulty marrying and age-related stigma. This finding is supported by a study conducted in the Harari region, in eastern Ethiopia[18]. This could be because early marriage is a widely accepted and practiced custom in Ethiopia.

Family wealth status was a significant predictor of age at first marriage. An increase in the wealth index from a lower to a higher level increases a girl's marital age by 0.922 years (β=0.922). This finding is in line with previous studies[9,28,30], showing parents' economic status is a potential determinant of marital age in developing countries.

Despite the legal age of marriage being 18 years old in Ethiopia[23], insufficient legal protection is one of the predictors of a girl's marriage below 18 years. In this study, the lack of legal punishment for offenders of early marriage decreases girls' age at first marriage by 0.600 years (β= -0.600). Another study reported that inadequate legal protection of girls' age at first marriage is a risk factor for early marriage[19]. Furthermore, one level increase in the mother's education increases the girls' age at first marriage by 0.677 years (β=0.677). This result contradicts a study conducted in the Amhara region, where the father's education status was significantly associated with the girls' age at first marriage[28]. However, parents' level of education has an influence on girls' age at marriage[20]. The marriage decision of an individual girl increases the age at first marriage by 0.254 years (β= 0.254). This finding is supported by earlier studies conducted in Ethiopia[18,30], showing that marriage decisions by parents are significantly associated with early marriage.

Family size was a negative predictor of a girl's age at first union. An increase in family size by one member decreases the girl's age at first marriage by 0.086 years (β= -0.086). The findings agree with a study done in northern Ethiopia, where girls from larger families were four times more likely to marry at an early age than their counterpart[28]. Families prefer to marry their girls at an early age to be free from financial constraints to care for and educate[19].

Even though the large sample size in this study enables generalization to the target population, the cross-sectional study design made it impossible to determine a cause-and-effect relationship between the predictor variables and the outcome.

CONCLUSION

This study revealed the average age of first marriage was lower than the national legal marital age. Girls from poorer families, low levels of education, and larger family sizes should be the target of intervention programs to end early marriage. Additionally, girls, parents, and the general public should be made aware of the impact of early marriage.

Ethical approval

The Bule Hora University Ethical Review Committee granted ethical approval before the start of the study (Ref.no.BHU-IOH 02-012). A permission letter was provided to the West Guji Zone administration office, selected districts, and Kebeles. The participants were informed of their freedom to withdraw from the study at any time, and their anonymity was protected by providing pseudonyms.

Data availability

Upon a reasonable request, the corresponding author will provide the data used to support the conclusions of this study.

Conflict of Interests

The authors declare that they have no conflict of interest.

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