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Intersections of Sociodemographic Factors and Cervical-Vaginal Infections: Implications for Preterm Birth and Abortion Outcomes

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Abstract

Background: Preterm labor and abortion, often influenced by cervical-vaginal infections, remain pressing reproductive health challenges. This study explores the interplay between socio-demographic factors, emerging pathogens like *Mycoplasma genitalium,* and their combined implications for these adverse pregnancy outcomes.

Methods and Results: The study utilized a retrospective approach based on sonographic databases, laboratory data, and clinical records of patients monitored at the Bylykbashi clinic and subsequently at the University Hospital of Obstetrics and Gynecology 'Mbreteresha Geraldine', Tirana. Data were analyzed from 2016 to 2020, involving a cohort of 1,738 pregnancies. The final group consisted of 1,482 pregnancies. These pregnancies were tracked from the time of pregnancy diagnosis until its conclusion. Vaginal secretion examinations were rigorously conducted using direct microscopy, cultures, and the A.F. GENITAL SYSTEM kit to diagnose *Ureaplasma-Mycoplasma* (UM) presence, with a focus on its association with abortions and preterm births.

Our study of 1,482 participants showed that 47.2% resided in urban areas, while 52.8% were from rural settings. Most participants fall within the 26-30 (29.6%) and 31-35 (28.1%) age groups. Regarding parity, 28.8% were primigravida, and 63% have had 12 years or less of formal education. The data showed that a significant portion (82.1%) of participants had their first sexual intercourse after the age of 18. The occurrence of urinary tract infections during pregnancy was reported by 32% of the women. UM-positive cases constituted 51.5% of the respondents. Group B *Streptococcus* and *Candida albicans* were detected in 28.5% and 47.0% of the respondents, respectively. Multivariate analyses identified younger age, early sexual debut, and primigravida status as notable risk factors for preterm births and abortions.

Conclusion: The correlation between sociodemographic factors and cervical-vaginal infections takes on significant importance in predicting maternal health outcomes, especially concerning preterm births and abortions. The heightened risk among younger individuals, those with early sexual debut, and those undergoing early onset of menarche underscores the profound influence of age and life experiences on cervical-vaginal health. Our findings related to cervical-vaginal infections emphasize the critical need for early detection, increased awareness, and prompt treatment. **(International Journal of Biomedicine. 2023;13(4):269-276.)**

Keywords: preterm birth • abortion • cervical-vaginal infections • socio-demographic factors

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Abbreviations

CVIs, cervical-vaginal infections; **UM**, *Ureaplasma-Mycoplasma*; **UTIs**, urinary tract infections; **GBS**, Group B *Streptococcus*.

Introduction

Preterm labor, occurring between 20 and 37 weeks gestation, is subcategorized into early preterm (before 33 weeks) and late preterm (34 to 36 weeks), while spontaneous abortion, or abortion, is the loss of pregnancy before 20 weeks, a phenomenon that the American College of Obstetricians and Gynecologists identifies as the most common form of pregnancy loss, with estimates suggesting up to 26% of all pregnancies and 10% of clinically recognized ones ending in abortion.[1,2] Cervical-vaginal infections (CVIs), predominantly caused by *Gardnerella vaginalis*, *Candidiasis*, and *Trichomoniasis*, account for 90% of infectious-origin diseases and are prevalent issues in clinical medicine.[3] Bacterial vaginosis, while not affecting conception, is linked to a heightened risk of first-trimester abortion, and vaginal or cervical infections pose a risk, especially when the cervix is short before 28 weeks or open before 37 weeks, leading to potential preterm labor.[4,5] In addition to infections, socio-demographic factors linked to preterm birth include maternal age ≤19 years or over 35, immigrant status, education level ≤ secondary studies, residence in large cities, and single mothers or those cohabitating outside marriage, especially in countries where such cohabitation isn't common.[6,7] Additionally, higher odds of pregnancy termination are observed among adolescent girls and young women (AGYW), those cohabiting or married, regular radio and television consumers, and those in high literacy communities, while AGYW with three or more births and those with secondary/higher education have reduced termination odds.[8] Another risk is posed by *Mycoplasma genitalium* (*Mgen*), which is emerging as a cause of sexually transmitted infections, while Ureaplasma species are linked to urologic, gynecologic, and obstetric issues in men, women, and neonates.[9]

This study explores the interplay between socio-demographic factors, emerging pathogens like *Mgen*, and their combined implications for these adverse pregnancy outcomes.

Materials and Methods

The study utilized a retrospective approach based on sonographic databases, laboratory data, and clinical records of patients monitored at the Bylykbashi clinic and subsequently at the University Hospital of Obstetrics and Gynecology 'Mbreteresha Geraldine', Tirana. Data were analyzed from a 5-year period, from 2016 to 2020, involving a cohort of 1,738 pregnancies.

Exclusion criteria were a history of abortions or premature births in previous pregnancies, a subseptate or septate uterus, fibromyomas, age <18 or >40 years, infectious diseases, multiple pregnancies, conception through in IVF, hypertension, diabetes.

After these exclusions, which totaled 256 pregnancies, the final group consisted of 1,482 pregnancies. These pregnancies were tracked from the time of pregnancy diagnosis until its conclusion.

Data Collection

The sonographic report indicated that the tracked pregnancies ranged from 7 to 40 weeks of gestation. Gestational age was primarily determined based on the first date of the last menstrual cycle and adjusted accordingly with the sonographic gestational age. Detailed patient records were utilized to extract data for this study based on comprehensive medical history and a questionnaire. Complementary laboratory examinations began upon the first ultrasound confirming the embryo's presence, fetal heartbeats, and adjustments to the last menstrual cycle date by sonographic gestational age, Routine examinations included a complete blood count, biochemical tests with hepatic and renal markers, glucose levels, TORCH testing, complete urine analysis, and vaginal swabs. Any patient who would be disqualified from the study based on blood test results was identified.

Vaginal Secretion Examination

For the examination of vaginal secretions, samples were collected by physicians. The woman was placed in a lithotomy position on a gynecological bed. A sterile, unlubricated speculum was introduced to expose the cervix. Sterile swabs collected material from the posterior fornix for direct microscopy, cultures, and endocervical sampling for *Ureaplasma-Mycoplasma* (UM) testing. Concurrently, vaginal pH was assessed using litmus paper. Samples prepared with swabs immediately underwent direct microscopy, culture, and suitable UM terrains. Culture secretions were incubated for 48 hours in blood agar and McConkay mediums. For UM, the A.F. GENITAL SYSTEM kit was used. The material collected with a sterile endocervical swab was suspended in a physiological solution from the kit for 5 minutes. Afterward, the swab was gently rotated in the vial walls to obtain a homogeneous material. Using a pipette, 0.2 mL of this material was placed in each of the 24 wells of the culture medium. These contained biochemical substrates and antibiotics necessary for researching, identifying, and performing an antibiogram for each microorganism isolated from the urogenital tract. They were then covered with a drop of oil and a matching lid and incubated at 36±1°C for 18-24 hours. For cases suspected of *Mgen* or *Ureaplasma* presence, the kit underwent additional incubation for 24 hours. The wells testing for UM presence contained urea and arginine substrates. This test provided semi-quantitative data on the isolated urogenital microorganisms, particularly for the UM species. Results obtained from the A.F. GENITAL SYSTEM kits were consistent with those acquired from traditional cultures for UM identification. Antimicrobial susceptibility testing provided data on sensitivity to nine antimicrobials: Tetracycline, Doxycycline, Pefloxacin, Ofloxacin, Erythromycin, Clarithromycin, Minocycline, Vancomycin, Clindamycin.

Direct Microscopy

Direct microscopy was conducted using a Bresser Researcher ICD microscope, specifically manufactured for biological studies. It featured two light sources that can be

superimposed as needed and adjustable dioptrics depending on the examiner's eye. The Amsel criteria were used to judge the presence of *Gardnerella* or *Trichomoniasis*, even though the kit itself included these measures.

Testing Schedule

All pregnant participants were tested for UM during weeks 7-12 and then again during weeks 21-24. The kit was repeated for all the women who tested positive. Treatment was based on antimicrobial sensitivity according to readings from the A.F. genital kit, with adjustments made based on the gestational period's requirements. Clinical and sonographic data integration results regarding UM positivity or negativity were combined with sonographic and anamnestic data from accompanying clinical records.

Incidence Calculation

After recording all positive UM cases, we determined the incidence of this infection within the population. Factors such as place of residence (origin) were considered to understand the variable's impact on the development of infection and its subsequent impact on abortions and preterm births.

Clinical Record Data

From the databases and clinical records, the incidence of preterm births and abortions was determined. These figures were then compared between the population that tested positive for UM and those that tested negative. This data also provided information about women who showed symptoms and those who were asymptomatic when samples were taken. From the clinical record data, 75% of women reported symptoms like dysuria, local itching, recurrent urinary infections, and changes in vaginal secretion consistency during sample collection.

Treatment Protocol

For all patients who tested positive in the first trimester, a regimen was applied, which involved clindamycin ointment, vitamin C supplementation, and interventions to acidify vaginal pH. Treatment adjustments were made based on symptoms. Practices such as vaginal douching were discouraged, and patients were advised to abstain from sexual activities to prevent potential infection transmission through sperm. In cases diagnosed with *Gardnerella vaginalis* or *Trichomonas vaginalis* presence, vitamin C treatment was preceded by vaginal ovules containing metronidazole. After completing treatment, the A.F. Genital System kit was used again to check for microbial eradication.

Statistical Analysis Methodology

Statistical analysis was performed using statistical software package SPSS version 21.0 (SPSS Inc, Armonk, NY: IBM Corp). Data Segregation: Data from clinical records were separated into demographic and general population data. A binomial treatment of the studied variables was chosen. Data Presentation and Analysis: Discrete data were presented in absolute value and percentage. Differences for discrete data were analyzed using the Chi-square test. Casual relationships between the dependent variable (preterm birth vs. term birth) and the independent variables were analyzed using binary and multivariate logistic regression, controlling for sociodemographic and obstetric confounders. For every variable, odds ratios (OR) and their 95% confidence intervals (CI) were presented. The Chi-square test and Fisher's exact test were used to determine statistically significant differences for the studied subjects and to explicitly determine the impact of UM for each event in the study. A probability value of $P \leq 0.05$ was considered statistically significant.

Results

Table 1 highlights key attributes of participants: 47.2% reside in urban areas, while 52.8% are from rural settings. Most participants fall within the 26-30 (29.6%) and 31-35 (28.1%) age groups. In terms of parity, 28.8% are primigravida (first-time pregnant), while a significant 71.2% are non-primigravida. Regarding education, 63% have had 12 years or less of formal education, contrasting with 37% who have pursued more than 12 years. Only 8.3% reported smoking, and a minor 10.7% consumed alcohol, while the majority refrained from both habits (Table 1).

Table 1.

Sociodemographic and Behavioral Characteristics of the Study Population.

Variables	n	%
Residence		
Urban	700	47.2
Rural	782	52.8
Age groups		
18 – 20	272	18.4
21 - 25	324	21.9
26 – 30	439	29.6
31 – 35	416	28.1
36 – 40	31	2.1
Parity		
Primigravida	427	28.8
Non-primigravida	1055	71.2
Education level		
≤12 years	933	63.0
> 12 years	549	37.0
Smoking		
Yes	123	8.3
No	1359	91.7
Alcohol consumption		
Yes	158	10.7
No	1324	89.3

Table 2 provides an analysis of health practices among our population. It delves into the onset of menarche, revealing that 35% of the respondents experienced it before the age of 12, while the majority (65%) underwent menarche after this age. Additionally, the data shows that a significant portion (82.1%) of participants had their first sexual intercourse after the age of 18. When exploring the number of partners, the overwhelming majority (81%) reported having three or

fewer partners. The occurrence of UTIs during pregnancy was reported by 32% of the women. The table further uncovers that 11.9% of the women used antibiotics before conception, while 29% used hormonal therapy in the same period. Additionally, the practice of vaginal douching was limited, with only 10% engaging in the activity. Interestingly, a significant 59% of the respondents reported engaging in oral sex. Lastly, regarding hygiene practices, 78% of the participants regularly used daily pads (Table 2).

Table 2.

Health Practice Assessment

Variables	n	%	95%CI	*P*-value
Onset of Menarche				
< 12 years	519	35.0	32.6–37.5	<0.01
> 12 years	963	65.0	62.5–67.4	
First Intercourse				
≤ 18 years	266	17.9	15.9–19.9	<0.01
> 18 years	1216	82.1	80.0–84.0	
Number of Partners				
≤ 3 partners	1201	81.0	71.9–82.9	<0.01
> 3 partners	281	19.0	17.0–21.0	
UTI during Pregnancy				
Yes	474	32.0	29.6–34.4	<0.01
No	1008	68.0	65.6–70.0	
Antibiotic Use Preconception				
Yes	177	11.9	10.3–13.6	<0.01
No	1305	88.1	86.3–89.7	
Hormonal Therapy Preconception				
Yes	430	29.0	26.7–31.4	<0.01
No	1052	71.0	68.6–73.2	
Vaginal Douching				
Yes	148	10.0	8.5–11.6	<0.01
No	1334	90.0	88.3–91.4	
Engaging in Oral Sex				
Yes	874	59.0	56.5– 61.4	<0.01
No	608	41.0	38.5–43.5	
Regular Use of Daily Pads				
Yes	1156	78.0	75.8–80.0	<0.01
No	326	22.0	19.9–24.1	

Table 3 provides a comprehensive breakdown of the prevalence of various CVIs among the studied population. UM-positive cases constituted 51.5% of the respondents, while 48.5% tested negative, with a statistically significant difference (P<0.01). Group B *Streptococcus* (GBS) was detected in 28.5% of the participants, leaving the majority, 71.5%, without this bacterial presence, showing a statistically significant variation. *Chlamydia* was notably less prevalent, with only 2.1% testing positive, as opposed to a whopping 97.9% testing negative, and this difference was statistically significant (P<0.01). Lastly, *Candida albicans*, a common fungus causing yeast infections, was present in 47.0% of the respondents, with the remaining 53.0% being unaffected, and this distinction was also statistically significant (P<0.01).

Tabel 3.

Cervical-vaginal infections assessment.

Variables	n	%	95%CI	*P*-value
Presence of UM+				
Yes	763	51.5	48.9–54.0	<0.01
No	719	48.5	45.9–51.0	
Presence of GBS				
Yes	422	28.5	26.2–30.8	<0.01
No	1060	71.5	69.1–73.8	
Presence of *Chlamydia*				
Yes	31	2.1	1.4–2.9	<0.01
No	1451	97.9	97.0–98.6	
Presence of *Candida albicans*				
Yes	696	47.0	44.4–49.6	<0.01
No	786	53.0	50.4–55.6	

In the univariate analysis of factors potentially associated with preterm birth (UM+), several variables were identified. Women aged ≤20 years demonstrated a 1.9-fold increased risk of preterm birth (95% CI: 1.4–2.6, P<0.01). Those with an education level of ≤12 years faced a 2.2-fold elevated risk (95% CI: 1.8–2.8, P<0.01). Primigravida women showed a slight elevation in risk, although this wasn't statistically significant (OR=1.2, 95% CI: 0.9–1.5, P=0.1). Smoking during pregnancy increased the risk by 1.5 times, but the result was borderline significant (95% CI: 0.9–2.3, P=0.09). Early initiation of intercourse (≤18 years) presented a 1.5-fold increased risk (95% CI: 1.1–1.9, P=0.01). Intriguingly, women with more than three partners had a significantly decreased risk (OR=0.1, 95% CI: 0.05–1.3, P<0.01). A prominent risk was observed with the presence of *Candida albicans*, showing an 8.7-fold increase (95% CI: 6.8–11, P<0.01). Early onset of menarche (<12 years), vaginal douching, engaging in oral sex, and regular use of daily pads were all found to significantly elevate the risk of preterm birth. Several other factors like UTIs during pregnancy, *Chlamydia* presence, and preconception hormonal therapy showed elevated risks, though not reaching statistical significance (Table 4).

In a multivariate logistic regression analysis, a significant association was observed between UM+ and several factors.

Notably, individuals younger than 20 had an OR of 1.9 (95% CI: 1.4–2.6, *P*<0.01). Additionally, those who experienced their first sexual intercourse at the age of 18 presented an OR of 1.4 (95% CI: 1.1–1.9, *P*<0.01). Furthermore, the onset of menarche before the age of 12 was linked to an OR of 1.3 (95% CI: 1.0–1.6, *P*<0.01) (Figure 1).

Table 4.

Univariate Logistic Regression Analysis of Risk Factors Associated with Preterm Birth (UM+)

Variables	UM+ (n)	%	OR	95%CI	*P*- value
Age					
≤ 20 years (n=272)	59	21.7	1.9	1.4–2.6	<0.01
Education level					
≤ 12 years (n=933)	217	23.3	2.2	1.8–2.8	<0.01
Parity					
Primigravida (n=427)	144	33.7	1.2	0.9–1.5	0.1
Smoking					
Yes (n=123)	28	22.8	1.5	0.9–2.3	0.09
First intercourse					
≤18 years (n=266)	87	32.7	1.5	1.1–1.9	0.01
Nr. of partners					
> 3 partners (n=281)	22	7.8	0.1	0.05–1.3	<0.01
UTI during Pregnancy					
Yes (n=474)	104	21.9	1.2	0.9–1.6	0.1
Antibiotic Use Preconception					
Yes (n=177)	69	39.0	0.9	0.7–1.3	0.6
Presence of *Chlamydia*					
Yes (n=31)	8	25.8	2	0.9– 4.5	0.09
Presence of GBS					
Yes (n=422)	107	25.4	1.3	0.9–1.6	0.07
Presence of *Candida albicans*					
Yes (n=696)	542	77.9	8.7	6.8–11	<0.01
Onset of Menarche					
< 12 years (n=519)	236	45.5	1.3	1.0–1.6	0.03
Hormonal Therapy Preconception					
Yes (n=430)	85	19.8	0.2	0.15–0.26	<0.01
Vaginal Douching					
Yes (n=148)	111	75.0	2.6	1.8–3.9	<0.01
Engaging in Oral Sex					
Yes (n=874)	533	61.0	1.9	1.5–2.3	<0.01
Regular Use of Daily Pads					
Yes (n=1156)	820	70.9	2.5	1.9–3.2	<0.01

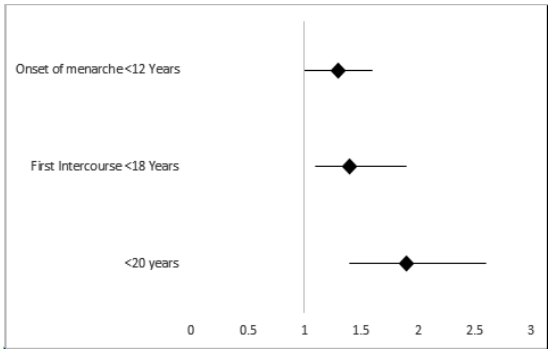

Fig. 1. *Associations between UM+ and Age, Age at First Intercourse, and Age at Menarche in a Multivariate Logistic Regression Analysis*

In the univariate logistic regression analysis presented in Table 5, examining specific population characteristics and their association with abortion, several findings were observed. Women aged ≤20 years had a 2.2-fold increased risk of abortion, albeit not statistically significant (95% CI: 0.40–12.25, *P*=0.3). Those with an education level of ≤12 years presented a 1.2-fold increased risk (95% CI: 0.41–6.45, *P*=0.8). Primigravida women demonstrated a notable 5.0-fold heightened risk, nearing significance (95% CI: 0.90–27.28, *P*=0.06). Smoking was associated with a 2.2-fold rise in abortion risk (95% CI: 0.25–19.15, *P*=0.4). Women whose first sexual encounter occurred at ≤18 years displayed a 2.3-fold increased risk (95% CI: 0.41–15.59, *P*=0.3). A distinct finding was the significant association between abortion and having more than three partners, showing an 8.7-fold amplified risk (95% CI: 1.57–47.5, *P*=0.01). Women who experienced menarche before 12 years of age had a reduced risk (OR=0.4, 95% CI: 0.04–3.17, *P*=0.3). Other factors such as UTIs during pregnancy, antibiotic use before conception, hormonal therapy before conception, presence of GBS, *Chlamydia*, *Candida albicans*, vaginal douching habits, oral sex activities, and regular use of daily pads were also assessed, but they did not exhibit statistically significant ties with abortion in this analysis.

In the results of the multivariate logistic regression analysis, three significant independent risk factors for abortion were identified. First, individuals with more than three partners had an OR of 8.7 (95% CI: 1.57–47.5, *P*<0.01). Secondly, primigravida women had an increased risk, with an OR of 6.8 (95% CI: 5.6–13.2, *P*<0.01). Lastly, those who had their first intercourse before the age of 18 presented an OR of 3.3 (95% CI: 1.4–16.7, *P*<0.01) (Figure 2).

Discussion

The complex interplay of sociodemographic factors and CVIs plays a pivotal role in maternal health outcomes, particularly concerning preterm births and abortions. This article seeks to explore these intersections and delve into their implications, providing a nuanced understanding of the underlying causes and potential preventive measures.

Table 5.

Specific Population Characteristics and Abortions. Univariate Logistic Regression Analysis.

Variables	Abortion n (%)	OR	95%CI	*P*-value
Age				
≤ 20 years (n=272)	2 (0.74)	2.2	0.40–12.25	0.3
Education level				
≤ 12 years (n=933)	4 (0.43)	1.2	0.41–6.45	0.8
Parity				
Primigravida (n=427)	4 (0.94)	5.0	0.90–27.28	0.06
Smoking				
Yes (n=123)	1 (0.81)	2.2	0.25–19.15	0.4
First intercourse				
≤18 years (n=266)	2 (0.75)	2.3	0.41–15.59	0.3
Nr. of partners				
> 3 partners (n=281)	4 (1.42)	8.7	1.57–47.5	0.01
Onset of Menarche				
< 12 years (n=519)	1 (0.19)	0.4	0.04–3.17	0.3
UTI during Pregnancy				
Yes (n=474)	2 (0.42)	1.1	0.19–5.82	0.9
Antibiotic Use Preconception				
Yes (n=177)	1 (0.56)	1.5	0.17–2.71	0.7
Hormonal Therapy Preconception				
Yes (n=430)	2 (0.47)	1.2	0.22–6.7	0.8
Presence of GBS				
Yes (n=422)	4 (0.95)	5.1	0.92–27.74	0.06
Presence of *Chlamydia*				
Yes (n=31)	1 (3.23)	9.6	1.09–85.04	0.04
Presence of *Candida albicans*				
Yes (n=696)	4 (0.57)	2.3	0.41–12.45	0.3
Vaginal Douching				
Yes (n=148)	1 (0.68)	1.8	0.20–15.58	0.5
Engaging in Oral Sex				
Yes (n=874)	2 (0.23)	0.3	0.06–1.89	0.2
Regular Use of Daily Pads				
Yes (n=1156)	3 (0.26)	0.3	0.05–1.39	0.1

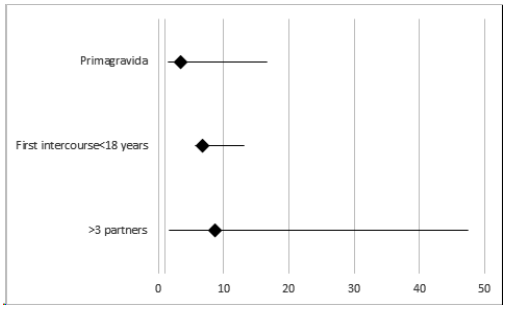

Fig. 2. *Independent Risk Factors for Abortion: ORs and 95% CIs from Multivariate Logistic Regression*

The age concentration of patients in the 26-35 bracket seems to correspond with global trends. According to WHO evidence, women in many regions are increasingly delaying childbearing to their late twenties and early thirties.[10] The marked difference in parity, with a substantial proportion being non-primigravida, might suggest cultural or health system factors influencing multiple pregnancies. The educational breakdown aligns with many global settings where completion of secondary education remains the most common highest attainment. The relatively low rates of smoking and alcohol consumption are encouraging and might reflect sociocultural norms regarding these behaviors, especially among potential mothers.[11]

A notable observation is the age at onset of menarche, with a significant 35% of respondents experiencing it before the age of 12, like other studies that indicate almost the same age at menarche's onset.[12] The fact that most participants initiated sexual activity after 18 might be reflective of cultural norms, educational efforts, or both, and this observation aligns with other studies emphasizing the trend toward delayed first sexual experiences in some demographics.[13] The reported number of partners and the relatively low occurrence of UTIs provide crucial insights into sexual health and risks. The data regarding antibiotic and hormonal therapy use preconception is noteworthy, as these factors may have implications for reproductive health.[14] The limited practice of vaginal douching is also linked with sociocultural norms, even though it resonates with global health advice cautioning against frequent douching.[15] The high percentage of respondents partaking in oral sex provides a dimension to understanding broader sexual health behaviors and practices. Lastly, the prevalent use of daily pads underscores the importance of understanding hygiene practices and their potential health implications.[16]Top of Form

Notably, more than half of the participants exhibited UM-positive cases, a prevalence rate that may be compared to other regional statistics for context.[17] The presence of GBS in over a quarter of participants warrants attention, especially given the potential implications for neonatal health. Conversely, the remarkably low prevalence of *Chlamydia*, though encouraging, suggests a possible success of prior awareness or intervention campaigns, yet it is essential to evaluate this in relation to other populations. As for *Candida albicans*, its presence in nearly half of the participants aligns with its known ubiquity and its common occurrence in many women; this prevalence rate agrees with global averages and emphasizes the need for continuous monitoring and awareness.[18] The marked differences in the prevalence rates of each infection underscore the diverse nature of CVIs and their varied presence in this specific population.

Considering the broader literature, our results elucidate key associations between UM+ and certain demographic and sexual health factors. For instance, individuals under 20 demonstrated a heightened risk, which aligns with previous studies indicating increased susceptibility in younger populations.[19] Likewise, the onset of sexual activity by the age of 18 has been previously linked to various health outcomes in the literature. Interestingly, our study further illuminates the

correlation between early onset of menarche (before age 12) and UM+, a connection that has been touched upon in prior research but necessitates more in-depth exploration.[20]

In comparison with existing literature, our findings underscore several significant independent risk factors for abortion. The observed increased risk in individuals with multiple sexual partners aligns with previous studies that highlight the correlation between the number of partners and adverse reproductive outcomes.[21] Additionally, the elevated risk for individuals who initiated sexual activity before the age of 18 complements past research, emphasizing the potential reproductive health consequences of early sexual debut.[22] Further studies are necessary to elucidate the potential mechanisms underlying these associations.

Although this study revealed some valuable information, it has several limitations. The study, being retrospective, relied on previously collected data, potentially making it susceptible to the accuracy and quality of past record-keeping. Its numerous exclusion criteria, such as the omission of those under 18 or over 40 and those who had IVF, could limit the generalizability of the results to a broader population. Furthermore, the research was centered in Tirana, Albania, which may not represent outcomes in other regions. The heavy reliance on self-reported data, like the date of the last menstrual cycle, introduces the possibility of recall bias. The use of a single kit for U-M testing and the Bresser Researcher ICD microscope for direct microscopy might have inherent biases or limitations in their respective methodologies.

Drawing from our extensive exploration, the intersections of sociodemographic factors and CVI emerge as critical determinants in the landscape of maternal health, particularly in the context of preterm births and abortions. As we conclude, it becomes paramount to emphasize the potential of this intersectional understanding in tailoring health interventions and policies. The nuances unraveled in this study underline the importance of a holistic approach, one that considers both sociodemographic intricacies and biological indicators, to mitigate risks and enhance maternal outcomes in diverse populations. Future endeavors in this realm hold the promise of not only enriching our comprehension but also fortifying preventive and therapeutic strategies in maternal healthcare.

Conclusion

Considering the comprehensive insights derived from our study, the correlation between sociodemographic factors and CVIs takes on significant importance in predicting maternal health outcomes, especially concerning preterm births and abortions. The heightened risk among younger individuals, those with early sexual debut, and those undergoing early onset of menarche underscores the profound influence of age and life experiences on cervical-vaginal health. Our findings related to CVIs—such as the elevated incidence of UM-positive cases, the presence of CBS, and the prevalence of *Candida albicans*—emphasize the critical need for early detection, increased awareness, and prompt treatment. These outcomes not only highlight potential causes for preterm births and abortions but also illustrate the deep interplay between individual behaviors, sociodemographic backgrounds, and biological factors in determining reproductive health outcomes. As we move forward in designing more tailored interventions, integrating these crucial findings will be vital in shaping strategies that not only target CVIs but also directly address the associated risks of preterm births abortions.

Competing Interests

The authors declare that they have no competing interests.

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