Comparison of the adolescent pregnancy outcomes between refugees and Turkish citizens

Oğuz Arslan[1], Burak Giray[2], Niyazi Tuğ[1]

¹Department of Obstetrics and Gynecology, University of Health Sciences Sancaktepe Sehit Prof. Dr. İlhan Varank Training and Research Hospital, İstanbul; ²Department of Obstetrics and Gynecology, Koc University Medical Faculty Hospital, İstanbul, Türkiye.

ABSTRACT

Background. Adolescent pregnant women have significant risk factors in terms of preterm birth, low birth weight, gestational and neonatal complications, and neonatal and infant deaths. In many countries, living as a refugee differs from living as a local citizen regarding education level, access to health services, and lifestyle. We aimed to compare the obstetric, perinatal, and neonatal outcomes of Turkish and refugee adolescent pregnant women admitted to a tertiary maternity center.

Methods. The study was planned as a retrospective cross-sectional. We included adolescent pregnant women who delivered between February 2018 and August 2023. Adolescent pregnant women were divided into two groups, the Turkish group and the Syrian refugee group, and compared with each other.

Results. One thousand and fifty-one Turkish and 742 refugee adolescent pregnant women were included in the study. Adolescent pregnancy rates are higher in refugees than in the Turkish group (p < 0.001). We found that maternal age (p < 0.001), preeclampsia rates (p=0.029), gestational age at delivery (p < 0.001), and cesarean delivery rates (p=0.02) were lower in refugee adolescent pregnant women. Furthermore, we found that the anemia rates (p < 0.001) and low birth weight newborn rates (p = 0.011) were higher in refugee adolescent pregnant women.

Conclusions. Enhancing the outcomes of adolescent pregnancies among refugees necessitates a heightened focus on education regarding sexual reproduction, increased prenatal follow-ups, and enhanced training in family planning.

Key words: adolescent pregnancy, immigrants, obstetric outcome, refugees.

Each year, 12 million adolescents give birth in developing countries.[1] In 2023, the adolescent fertility rate was 4.13% worldwide, and this rate was 1.46% in Turkey.[2] Adolescent pregnant women are less likely to access early and adequate prenatal care than adults.[3] In general, adolescents seek antenatal care late due to lack of information, limited access to health services, social pressure, fear of stigma, or all of these factors.[4] Adolescent pregnancies constitute a significant risk for many adverse outcomes, including preterm birth, low birth weight, gestational and neonatal complications, and neonatal and infant deaths.[5]

Pregnancy outcomes are riskier for pregnant refugee women due to inadequate shelter and nutrition, security problems, stress, barriers to accessing health services, and difficulty in accessing prenatal care.[6]

In March 2011, when the civil war broke out in Syria, the mass migration to Turkey began. As of June 2023, Turkey hosts the world's largest refugee population, with approximately 3.7 million under temporary protection: Syrians, refugees, and asylum seekers of other nationalities.[7] About half (47.56%) of the refugees are women, and the rate of adolescent girls between the ages of 10-18 is 18.77% among

the refugee women. Since 2014, Turkey has continued to host the most refugees worldwide. The rate of refugee babies born in Turkey has been over 750,000 since 2011. Istanbul is a metropolitan city in Turkey with a population of 16 million. The most significant number of refugees, with 532,236 individuals, live in Istanbul, and the rate of refugees living in the city is 14.37% of the refugees in the country.[8,9] Sixteen percent of the refugees in Istanbul are adolescent girls between the ages of 10-18.[10]

This study aimed to compare Turkish adolescent pregnant and refugee adolescent pregnant women in terms of obstetric, perinatal, and neonatal outcomes.

Materials and Methods

Our maternity center had 26,364 births between February 2018 and August 2023. Among these, 22,403 births belonged to the Turkish group, while 3,961 births were from the refugee group. Notably, 1,792 of these births were teenagers. Among the Turkish group, 1051 out of 22,403 births (4.69%) were from adolescents, while in the refugee group, 742 out of 3961 births (18.7%) were from adolescents. We included adolescents between 14 and 19 who gave birth in our clinic. Because there were no pregnant adolescents who gave birth younger than the age of 14 in our hospital. Adolescent pregnant women were divided into two groups, the Turkish group, and the Syrian refugee groups, and compared with each other. All 1793 adolescents (1051 Turkish adolescent pregnant women and 742 refugee adolescent pregnant women) were included in the study. We accessed the pregnant women's data from the hospital database electronic records. Pregnant women aged 20 and over, births before 20 weeks of gestation, and pregnant women of non-Turkish or Syrian nationality were not included in the study. The study was conducted in accordance with the principles of the Declaration of Helsinki. During the data collection phase, the adolescents' identification numbers were anonymized. Informed consent is not required

due to the type of research. The maternal outcomes were identified as age, gravida, parity, abortion, chronic diseases, coronavirus disease (COVID-19) history, hepatitis B positivity, chronic hypertension, gestational hypertension, preeclampsia, hemolysis elevated liver enzymes low platelet (HELLP) syndrome, eclampsia, gestational diabetes mellitus (GDM) and cholestasis of pregnancy. The perinatal outcomes were designated as gestational week at delivery, preterm labor, premature rupture of membranes, intrauterine growth restriction (IUGR), small for gestational age (SGA) infant, large for gestational age (LGA), macrosomia, oligohydramnios, spontaneous vaginal delivery, instrumental delivery (only vacuum-assisted vaginal delivery), cesarean delivery and indication, perineal laceration, placental abruption, stillbirth, maternal complications, puerperal complications, maternal anemia, prepartum and postpartum hemoglobin values, postpartum hemorrhage, postpartum need for blood transfusion and postpartum intravenous iron treatment. The neonatal outcomes included birth weight, newborn first and fifth-minute APGAR scores, newborn intensive care unit (NICU) needs and indications, newborn complications, newborn congenital anomalies, and neonatal death. Approval for the study was received from the ethics committee of the Sancaktepe Sehit Prof. Dr. İlhan Varank Training and Research Hospital (approval number: 2023/166).

Statistical analysis

Data were statistically analyzed using International Business Machines (IBM, Armonk, NY, USA) Statistical Package for the Social Sciences (SPSS) Statistics for Windows v.20.0 (IBM Corp.). Descriptive statistical methods (mean, standard deviation, median, frequency, percentage, minimum, maximum) were used when evaluating the study data. The normal distribution of quantitative data was checked using the Kolmogorov-Smirnov test and graphics. If the variables were parametric, a Student t-test was used. If the variables were

non-parametric, the Mann-Whitney U test was used. Pearson chi-square test and Fisher's exact test were used to compare qualitative data. A p-value < 0.05 was considered statistically significant.

Results

There were 26,364 births in our maternity center between February 2018 and August 2023. In our study, 1,051 (4.69%) of 22,403 births were of the adolescent period in the Turkish group, and 742 (18.7%) of 3,961 births were of the adolescent period in the refugee group.

In our study, with 1,793 adolescent pregnant women, the mean age of refugee pregnant women was 17.96 ± 1.07 years, and the mean age of the Turkish group was 18.36 ± 0.83 years. The mean age of the refugee adolescent group was lower and statistically significant (p < 0.001). Gravida and parity were higher in the refugee adolescent pregnant group, but abortion numbers were higher in the Turkish group. These differences are statistically significant (p < 0.001). Chronic disease (p < 0.001), gestational

hypertension (p = 0.009), and preeclampsia (p = 0.029) rates were significantly higher in the Turkish group. The two groups were similar in terms of the history of COVID-19 (p = 0.482), hepatitis B positivity (p = 0.061), chronic hypertension (p = 0.414), eclampsia (p = 0.515), HELLP syndrome (p = 1.000), GDM (p = 1.000) and cholestasis of pregnancy (p = 0.655) (Table I).

The gestational age at delivery was 38.94 ± 1.80 weeks in the Turkish group and 38.44 ± 1.69 weeks in the refugee adolescent group. The gestational age at delivery was significantly lower in the refugee adolescent pregnant group (p < 0.001). The rate of spontaneous vaginal delivery (p < 0.001) was significantly higher in the refugee adolescent pregnant group, and the rates of cesarean delivery (p = 0.02) and instrumental delivery (p = 0.013) were significantly higher in the Turkish group. Oligohydramnios (p = 0.038) and postpartum intravenous iron treatment (p = 0.043) were significantly higher in the Turkish group. Episiotomy (p < 0.001) was significantly higher, and perineal tear (p < 0.001) was significantly lower in the Turkish

Table I. Maternal clinical characteristic of Turkish and refugee pregnant adolescents.

	Turkish citizens (n=1051)	Refugees (n=742)	p
Maternal age (years)	18.36 ± 0.83	17.96 ± 1.07	**<0.001**
Gravida	1 (1-5)	1 (1-6)	**<0.001**
Parity	0 (0-2)	0 (0-3)	**<0.001**
Nulliparous women	836 (79.5)	451 (60.8)	**<0.001**
Multiparous women	215 (20.5)	291 (39.2)	**<0.001**
Previous induced abortions	0.08 ± 0.31	0.04 ± 0.29	**0.009**
Chronic disease	42 (4)	7 (0.9)	**<0.001**
History of COVID 19	6 (0.6)	2 (0.3)	0.482
Hepatitis B positivity	10 (1)	1 (0.1)	0.061
Chronic hypertension	0 (0)	1 (0.1)	0.414
Gestational hypertension	13 (1.2)	1 (0.1)	**0.009**
Preeclampsia	20 (1.9)	5 (0.7)	**0.029**
Eclampsia	2 (0.2)	0 (0)	0.515
HELLP syndrome	1 (0.1)	0 (0)	1.000
Gestational diabetes mellitus	4 (0.4)	2 (0.3)	1.000
Cholestasis of pregnancy	4 (0.4)	1 (0.1)	0.655

Values are presented mean ± SD, median (range) and n (%).
COVID 19: Coronavirus disease, HELLP: hemolysis elevated liver enzymes low platelet.

group than in the refugee group. In addition, the maternal anemia rate was significantly higher in the refugee group than in the Turkish group (p < 0.001). There was no statistically significant difference between the two groups in preterm labor (p = 0.412), premature rupture of membranes (p = 0.474), placental abruption (p = 1.000), maternal complications (p = 0.057), puerperal complications (p = 0.221), pre and

postpartum hemoglobin (p = 0.394, p = 0.059 respectively) postpartum hemorrhage (p = 0.858), postpartum blood transfusion (p = 0.858) (Table II).

The mean birth weight in the Turkish group was 3177.19 ± 491.25 grams, and 3101.17 ± 466.85 grams in the refugee group. Birth weight is statistically significantly lower in the refugee group (p = 0.001). The two groups were similar

Table II. Perinatal clinical characteristic of Turkish and refugee pregnant adolescents.

	Turkish citizens (n=1051)	Refugees (n=742)	p
Gestational week at delivery	38.94 ± 1.80	38.44 ± 1.69	**<0.001**
Preterm labor	71 (6.8)	43 (5.8)	0.412
Premature rupture of membranes	53 (5)	35 (4.3)	0.474
Oligohydramnios	66 (6.3)	30 (4)	**0.038**
Spontaneous vaginal delivery	850 (80.9)	647 (87.2)	**<0.001**
Instrumental delivery	12 (1.1)	1 (0.1)	**0.013**
Cesarean delivery	189 (18)	94 (12.7)	**0.02**
Placental abruption	3 (0.3)	2 (0.3)	1.000
Perineal wound*	826 (95.8)	588 (90.7)	**<0.001**
Episiotomy	636 (73.8)	405 (62.5)	**<0.001**
Perineal tears	101 (11.7)	131 (20.2)	**<0.001**
Episiotomy + Perineal tears	89 (10.3)	52 (8)	0.128
Maternal complication	12 (1.1)	17 (2.3)	0.057
Atony of the uterus	4 (0.4)	7 (0.9)	
Retained placenta	2 (0.2)	7 (0.9)	
Cervical laceration	2 (0.2)	2 (0.3)	
Vaginal hematoma	2 (0.2)	0 (0)	
OASIS	2 (0.2)	1 (0.1)	
Puerperal complication	17 (1.6)	7 (0.9)	0.221
Episiotomy dehiscence	8 (0.8)	5 (0.7)	
Hemorrhoids	4 (0.4)	0 (0)	
Endometritis	2 (0.2)	2 (0.3)	
Anal fissures	1 (0.1)	0 (0)	
Skin incision dehiscence	2 (0.2)	0 (0)	
Maternal anemia (Hemoglobin < 11g/dl)	250 (23.8)	249 (33.6)	**<0.001**
Prepartum hemoglobin (g/dl)	11.53 ± 1.31	11.47 ± 1.45	0.394
Postpartum hemoglobin (g/dl)	10.38 ± 1.40	10.53 ± 1.46	0.059
Postpartum hemorrhage	20 (1.9)	15 (2)	0.858
Postpartum intravenous iron treatment	89 (8.5)	44 (5.9)	**0.043**
Postpartum blood transfusion	20 (1.9)	15 (2)	0.858
Maternal death	0 (0)	0 (0)	-

*In women who had vaginal delivery.
Values are presented mean ± SD, and n (%).
OASIS: Obstetric anal sphincter injuries.

in terms of IUGR (p = 0.197), SGA (p = 0.148), LGA (p = 0.501), macrosomia (p = 0.135), stillbirth (p = 0.537), very low birth weight (p = 1.000), extremely low birth weight (p = 0.696), first and fifth minute APGAR score (p = 0.197, p = 0.316 respectively), need for NICU (p = 0.608), newborn complications (p = 0.466), newborn congenital anomalies (p = 0.516) (Table III).

We evaluated the indications for cesarean delivery: previous cesarean section (p < 0.001) was significantly more prevalent, whereas macrosomia (p = 0.014) and arrested labor (p = 0.04) were significantly less prevalent in the

refugee group compared to the Turkish group. There was no statistically significant difference between the groups among other cesarean delivery indications (Table IV). There were no maternal or neonatal deaths during the study period.

Discussion

The adolescent birth rate was about 7% of all births in the hospital. In the refugee adolescent group, maternal anemia, perineal tears, and low birth weight were higher than in the

Table III. Fetal and newborn clinical characteristic of Turkish and refugee pregnant adolescents.

	Turkish citizens (n=1051)	Refugees (n=742)	p
Intrauterine growth restriction	45 (4.3)	23 (3.1)	0.197
Small for gestational age (3-10th percentile)	134 (12.7)	78 (10.5)	0.148
Large for gestational age (90-95th percentile)	20 (1.9)	11 (1.5)	0.501
Macrosomia (>95th percentile)	15 (1.4)	5 (0.7)	0.135
Stillbirth	7 (0.7)	3 (0.4)	0.537
Birth weight (grams)	3177.19 ± 491.25	3101.17 ± 466.85	**0.001**
Low birth weight (1500-2500 grams)	47 (4.5)	54 (7.3)	**0.011**
Very low birth weight (1000-1500 grams)	4 (0.4)	3 (0.4)	1.000
Extremely low birth weight (<1000g)	3 (0.3)	3 (0.4)	0.696
First minute APGAR	7.79 ± 0.85	7.83 ± 0.73	0.197
Fifth minute APGAR	8.87 ± 0.78	8.9 ± 0.64	0.316
Need for neonatal intensive care	100 (9.6)	66 (8.9)	0.608
Respiratory failure	63 (6)	50 (6.7)	
Sepsis	27 (2.6)	15 (2)	
Hypoglycemia	10 (1)	1 (0.1)	
Newborn complications	33 (3.2)	28 (3.8)	0.466
Clavicle fracture	5 (0.5)	2 (0.3)	
Caput succedaneum	24 (2.3)	25 (3.4)	
Cephal hematoma	2 (0.2)	1 (0.1)	
Over riding	2 (0.2)	0 (0)	
Newborn congenital anomalies	35 (3.3)	29 (3.9)	0.516
Cardiovascular	4 (0.4)	4 (0.5)	
Skin-skeleton	12 (1.1)	9 (1.2)	
Gastrointestinal	3 (0.3)	0 (0)	
Orofacial	5 (0.5)	5 (0.7)	
Genitourinary	11 (1)	10 (1.3)	
Cerebrospinal cord	0 (0)	1 (0.1)	
Neonatal death	0 (0)	0 (0)	-

Values are presented mean ± SD, and n (%).
APGAR: Activity Pulse Grimace Appearance Respiration.

Table IV. The distribution of the indications in the in the cesarean section pregnant women.

	Turkish citizens (n=189)	Refugee (n=94)	p
Previous cesarean section	37 (19.6)	39 (41.5)	**<0.001**
Fetal distress	53 (28)	25 (26.6)	0.798
Breech presentation	32 (16.9)	16 (17)	0.985
Transverse presentation	2 (1.1)	2 (2.1)	0.602
Footling presentation	0 (0)	1 (1.1)	0.332
Multiple pregnancy	6 (3.2)	2 (2.1)	1.000
Umbilical cord prolapse	1 (0.5)	1 (1.1)	1.000
Macrosomia	23 (12.2)	3 (3.2)	**0.014**
Cephalopelvic disproportion	6 (3.2)	0 (0)	0.183
Maternal diseases that prevent pushing	4 (2.1)	0 (0)	0.305
Severe preeclampsia	5 (2.6)	1 (1.1)	0.667
Placenta previa	0 (0)	2 (2.1)	0.110
Arrested labor	16 (8.5)	2 (2.1)	**0.040**
Placental abruption	3 (1.6)	0 (0)	0.553
Gastroschisis	1 (0.5)	0 (0)	1.000

Values are presented n (%).

Turkish group. In the Turkish group, the rates of gestational hypertension, macrosomia, and preeclampsia were higher than in the refugee group.

In our study, we detected 1051 (4.69%) adolescent pregnancies among Turkish pregnant women and 742 (18.7%) adolescent pregnancies among refugee pregnant women. Adolescent pregnancy rates were higher among the refugees. In the study conducted by Çelik et al.[11], the adolescent pregnancy rate in the refugees was 17%, and the pregnancy rate in Turkish adolescents was 3%; Aktoz et al.[12] the adolescent pregnancy rate in the refugees was 16.8%, and the pregnancy rate in Turkish adolescents was 4.3%; Vardar et al.[13] the adolescent pregnancy rate in refugees was 11%, and the pregnancy rate in Turkish adolescents was 3.9%. In our study, we found that the mean age of the refugee group was lower, and the gravida and parity were higher than those of the Turkish group. According to a study by Golbasi et al.[14], the mean age was lower, and the parity was higher in refugee adolescent pregnant women. In the study by Al Nuaimi et al.[15], the age of refugee pregnant women was lower, and the gravida was higher than that of Turkish pregnant women. In the literature, we see that, similar to our results, adolescent pregnancy rates, gravida, and parity are significantly higher, and maternal age is significantly lower in refugees. Families who are forced to leave their homes and leave their countries due to war experience economic and financial difficulties in the different countries as refugees. Parents encourage daughters to marry young to reduce household size and decrease the cost of living.[16] We think that this planning causes adolescent pregnancies among refugees at younger ages and higher rates. Refugee adolescent pregnant women who are affected by civil wars and conflicts have limited knowledge of family planning[17] and lack the health literacy necessary for contraceptive use.[18] These adverse conditions explain the higher gravida and parity among refugees. In this study, the mean of previous induced abortion in the refugee group was lower than in the Turkish group. In the study reported by Demirci et al.[19], previous induced abortions were lower among refugees. It is difficult for refugees to access sexual health clinics. The negative attitude and parental pressure are very high for abortions.[20] These factors explain the lower rates of previous induced abortions in refugee adolescent pregnant women.

In our study, we found that the rates of chronic disease, gestational hypertension, and preeclampsia were higher in the Turkish group. In the study conducted by Sayili et al.[21], the rate of chronic diseases in the Turkish group was higher than in the refugee group. In the study of Erenel et al.[22], preeclampsia rate in the control group of Turkish pregnant women was higher than in refugee pregnant women. In the study by Golbasi et al.[14], gestational hypertension was more common in Turkish adolescent pregnant women. Advanced maternal age and the first pregnancy are risk factors for preeclampsia.[23] In our study, the lower gravida and parity rates are predisposing factors for developing preeclampsia. Additionally, nutritional deficiency is common in the refugee adolescent group due to difficult living conditions. This condition causes refugees to be weak and have a lower body mass index. High body mass index increases the risk of preeclampsia.[24]

When we evaluated adolescent pregnant women according to delivery method, we found that the rate of spontaneous vaginal delivery was higher in the refugee group, and the rate of instrumental delivery and cesarean delivery was higher in the Turkish group. The results are similar to those of the study conducted by Kasoha et al.[25] In our study, we think that the higher rate of spontaneous vaginal delivery in refugee adolescent pregnant women depends on the genetic structure, ethnic origin, and socioeconomic factors of the Syrian society. However, our experience shows that Turkish adolescent pregnant women prefer cesarean delivery because their economic conditions are better, and they believe that a cesarean section is less painful. In addition to this, higher maternal age and higher maternal comorbidities such as chronic disease and preeclampsia in the Turkish group support the higher cesarean delivery rates. Our study found a higher rate of oligohydramnios in the Turkish group. In our country, the government covers the health care expenses of refugees. Health care in public hospitals is free for refugees. Although it is free, refugee adolescents do not routinely visit a health center during pregnancy. We especially think that the language barrier and sociocultural factors prevent routine health center visits. The rate of oligohydramnios is low in refugee adolescent pregnant women because antenatal care is not adequate. In this study, we found high rates of maternal anemia in refugee adolescent pregnant women. In the study reported by Turkay et al.[26], maternal anemia rates are high in refugee adolescent pregnant women. We attribute the higher rates of anemia in refugee adolescent pregnant women to malnutrition, a deficiency of necessary iron and vitamin supplements during pregnancy, and lack of knowledge about healthy eating. Moreover, adolescent pregnancy is a more critical form of nutrition for bone development and growth. Our study found higher postpartum intravenous iron treatment rates in the Turkish group. This finding may be the result of higher cesarean section rates in the Turkish group.

In this study, we found that the mean birth weight of newborns was lower, and the number of low-birth-weight newborns was higher in the refugee adolescent group. In the meta-analysis reported by Bollini et al.[27], the rate of low-birth-weight newborns in refugee pregnancies was higher than in native pregnancies. We think this leads to a higher number of low-birth-weight newborns in refugee adolescent pregnant women because of pregnancy at a young age, a high rate of anemia, and inadequate prenatal care. Although chronic diseases cause low birth weight, early diagnosis and treatment could avoid worse pregnancy outcomes. Therefore, the Turkish group may have had a lower low-birth-weight rate because of good antenatal care.

When we searched the indications for cesarean section in adolescent pregnancies, we detected that the indication for previous cesarean section is more common in the refugee group, and the indications for macrosomia and labor arrest are more common in the Turkish group. Golbasi et al.[14] showed that the indication for previous cesarean sections was higher among refugees, and the indication for labor arrest was higher

among Turkish. In this study, we found lower rates of oligohydramnios, chronic disease, gestational hypertension, and preeclampsia in refugee adolescent pregnant women. We can explain the positive results in refugee adolescent pregnant women with genetic and racial differences.

To the best of our knowledge our study is the only investigation in Istanbul, the city that hosts the most refugees in Turkey, which hosts the most refugees in the world. Additionally, in this study, we evaluated two risk groups, both adolescents and refugee groups and the large sample size is also another strength of our study. However, the present study also has some limitations which should be pointed out. Although we thought that refugees generally had fewer admitions to health centers, we do not have any data to document this. The retrospective nature of the of the study and its single-center design are also important limitations.

In conclusion, adolescent refugee pregnancies, a combination of two vulnerable groups, will increase as wars continue worldwide. In our study, we found that maternal age, rates of previous induced abortion, chronic disease, gestational hypertension, preeclampsia rates, gestational age at delivery, oligohydramnios rates, instrumental delivery, and cesarean delivery rates, postpartum intravenous iron treatment need, and newborn birth weight were lower in refugee adolescent pregnant women. Furthermore, we found that the gravida and parity, the number of spontaneous vaginal deliveries, anemia rates, and low birth weight newborn rates were higher in refugee adolescent pregnant women. To improve refugee adolescent pregnancy outcomes, sexual reproduction education, prenatal follow-ups, and family planning training should be increased. They should be adapted to business life to improve economic conditions. The number of interpreters in the hospital should be increased. Refugees should be given free courses to learn the host country's language.

Ethical approval

Approval for the study was received from the ethics committee of the Sancaktepe Sehit Prof. Dr. İlhan Varank Training and Research Hospital (approval number: 2023/166).

Author contribution

The authors confirm contribution to the paper as follows: study conception and design: OA, BG, NT; data collection: OA, BG, NT; analysis and interpretation of results: OA, BG, NT; draft manuscript preparation: OA, BG, NT. All authors reviewed the results and approved the final version of the manuscript.

Source of funding

Conflict of interest

The authors declare that there is no conflict of interest.

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