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Original article

Impact of Placenta Previa on Maternal and Neonatal Outcome

Nourryah Turkuman[1], Laila Almahdi[1]*, Huda Othman[1], Abdulrahman Alsharef[1], Zeinab Saleh[2], Rehab Jerbi[2]

[1]Department of Obstetrics and Gynecology, Faculty of Medicine, University of Tripoli, Libya
[2]Department of Community and Family Medicine, Faculty of Medicine, University of Tripoli, Libya

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Corresponding Email. *lailadebri@gmail.com*
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ABSTRACT

Background and aims. *Placenta previa is one of the major disorders occurs during pregnancy, when placental tissue is abnormally placed in lower uterine segment over or near the internal cervical os. The greatest risk of placenta previa is bleeding. Bleeding often occurs in the lower part of the uterus as it begins to stretch and lengthen in preparation of delivery. The aim of this study was to determine the maternal and neonatal outcome of different types of placenta previa and associated risk factors.* ***Methods****. This was a retrospective study conducted at Aljala maternity hospital of Tripoli, Libya. Hospital chart records of one year (1st January to 31st December 2019). Chart records included all women who had undergone cesarean section for placenta previa.* ***Results.*** *During the study period, there were 92 cases of cesarean sections done for placenta previa, which was (0.95 %) of total deliveries, (43.47%) had type III PP, (26.08%) had type IV PP, (16.30%) had type II PP, (14.12%) had type I PP, (43.47%) delivered by emergency c/s, and (56.60%) delivered by elective c/s. Majority of women were in age group (30-35) years (41.30%). About (57.60%) of the patient were multipara (1-3 deliveries), (88.04%) patients had history of cesarean section, and (31.52%) patients had history of evacuation and curettage procedure (E&C). Approximately (38.04%) of babies were preterm, (25%) were low birth weight babies, (3.26%) neonatal death, (23.19%) of babies had NICU admission, (75%) of patients had blood transfusion, (21.73%) of patients had hysterectomy, and (34.78%) of patients had ICU admission.* ***Conclusion****. Placenta previa danger to both the mother and the baby with high maternal morbidity and adverse perinatal outcome. Advanced maternal age, multiparity, and previous histories of cesarean section and E&C were significantly associated risk factors of placenta previa.*

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INTRODUCTIO

Placenta previa is a disorder that happens during pregnancy that is characterized by the presence of placental tissue close to or covering the cervix. The greatest risk of placenta previa is bleeding. Bleeding often occurs as the lower part of the uterus begin to stretch and lengthen in preparation of delivery. When the cervix begins to efface and dilate, the placenta's attachment to the uterine wall becomes loose, resulting in bleeding [1]. All placentas overlying the os (to any) degree are termed previa, and those near to but not overlying the os are termed low-lying [2]. Obstetric hemorrhage is one of the most common causes of maternal morbidity and mortality worldwide. Abnormal placentation, is currently the most common indication for peripartum hysterectomy. placenta previa accounts for one third of all cases of APH [3]. Placenta previa is graded into different types depending on how close is the lower margin of the placenta to the internal os and whether it is situated anterior or posterior wall of the uterus [4]. Type I placentas implant in the lower uterine segment but do not reach the internal os, type II placentas reach the internal os but do not cover it, type III placentas cover the internal os but not at full dilatation, and type IV placentas cover the internal os even at full cervical dilatation of the cervix [5].

The incidence of placenta previa is 3-5 per 1000 pregnancies worldwide, and it is still rising because increasing cesarean section rates. This is because a uterine scar in the lower segment may attract a low implantation of the placenta [6]. Given the rising incidence of cesarean section combined with increasing maternal age, the number of cases of placenta previa and it is complications, including placenta accrete, will continue to increase. Deficiency of the decidua basalis at the endometrial scar is thought to be the cause of placenta accrete. It is a form of morbidly adherent placenta with superficial uterine attachment. Placenta increta is characterized by placenta penetration into myometrium. Placenta percreta is the

most severe form of morbidly adherent placenta, in which the placenta penetrates through the uterine wall and other pelvic organs, most commonly the bladder. Morbidly adherent placenta is a serious complication of pregnancy and is associated with massive intra partum hemorrhage and high maternal morbidity and mortality [7-8]. Neonates born to mothers with placenta previa more likely suffer from preterm birth, perinatal death, congenital malformations, and Apgar scores at 1 minute and 5 minutes lower than 7 [9-15].

Perinatal morbidity is also studied that majority of babies require resuscitation and NICU admission [13]. Previous studies have estimated the rate of hysterectomy among women with placenta previa to be 5%. Pregnancies complicated with placenta previa have also a significantly higher rate of postpartum anemia (OR 5.5,95% CI: 44-69) and delayed discharge from the hospital [8]. Surgery for morbidly adherent placenta is a considerable challenge but it has been reported that maternal morbidity is reduced in woman who deliver in a tertiary care hospital with multispecialty care team [12,16].

Placental bleeding is thought to occur when gradual changes in the cervix and lower uterine segment apply shearing forces to the inelastic placental attachment site, resulting in partial detachment. Vaginal examination or coitus can also disrupt the intervillous space and cause bleeding. Bleeding is primarily maternal, but fetal bleeding can occur if a fetal vessel is disrupted [17_20]. The current study was conducted to determine the maternal and neonatal outcome of different types of placenta previa and associated risk factors.

METHODS

Study design

Retrospective case series descriptive study.

Study setting

This study was conducted at Aljala Maternity Hopital in Tripoli/Libya.

Study period

During the year 2019

Study population

Ninety-two patients who had undergone cesarean section for placenta previa were included in this study. A verbal consent was taken from each patient regarding their participation in the study. The following data was obtained from patient record: the age, parity, history of previous C/S and E&C, risk factors for placenta previa, placental site, maternal and neonatal outcome and complications.

Statistical analysis

Data was analyzed using SPSS (IBM SPSS Statistics for Windows, Version 21.0). Frequencies and percentage were reported for each variable.

RESULTS

Age distribution of the patients:

The mean age for P.P patients was (36.1 years). The maximum age of the patients was 44 years and the minimum age was 20 years. Most of the age distribution of the patients in this study was between 30 and 35 years, which account for 41.30%. The least percentage was patients between 20-29 years (22.82%).

Table 1. Age distribution of the patients

Age distribution of the patients	No. (%)
20 – 29 years	21 (22.82%)
30 – 34 years	38 (41.30%)
≥35 y ears	33 (35.86%)
Total	92

Parity distribution of the patients

Regarding the parity of P.P patients, about (4.34%) of the patients were nulliparous, (57.60%) were between para 1 and para 3, (35.86%) were between para 4 and para 6 and only (2.17%) were more than 6 parity. The parity distribution in this study ranged between nullipara and para 8.

Table 2. Parity distribution of the patients

Parity distribution	No. (%)
Nulliparous	4 (4.34%)
1 – 3	53 (57.6o%)
4 – 6	33 (35.86%)
> 6	2 (2.17%)
Total	92

History of miscarriage

Regarding the miscarriage history, about two third of the patients in the present study (64.13%) had no history of abortion before. The rest of the patients had positive history of abortion (35.86%).

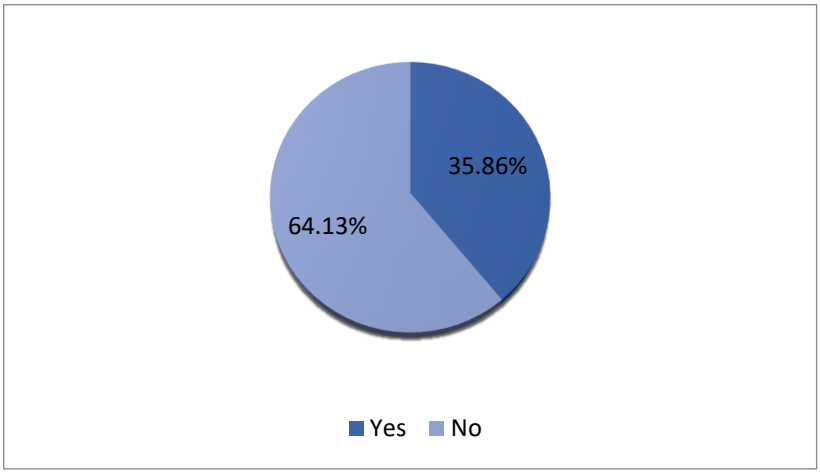

Figure 1. History of miscarriage

Risk factors for placenta previa

The potential risk factors for placenta previa that was studied in the current study were as following; 9.78% had history of induced pregnancy, 5.43% had history of twin pregnancy, 33.69% had previous E&C, 88.04% had previous cesarean section, and 31.52% had both C/S and E&C.

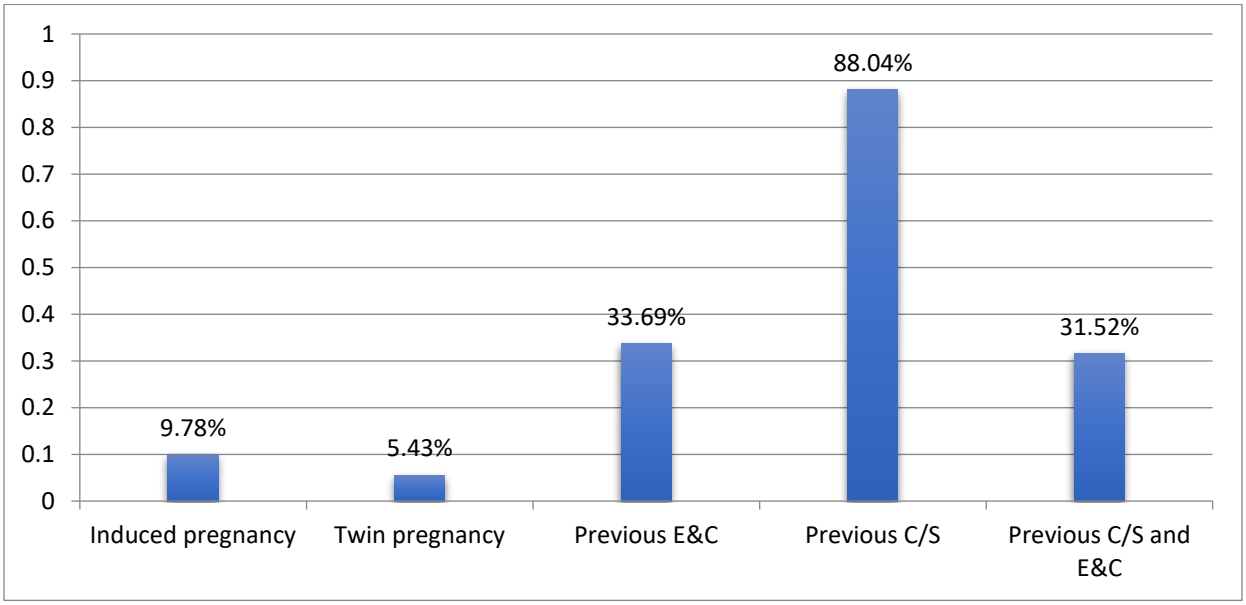

Figure 2. Risk factors for placenta previa

Type of placenta

In respect to placental type in the current study, the result was as following; (43.47%) of patients had type III PP, (26.08%) had type IV PP, (16.30%) had type II PP, (14.13%) had type I PP.

Table 4. Types of placenta previa

Placental type	No%
Type I	13 (14.13%)
Type II	15 (16.30%)
Type III	40 (43.47%)
Type IV	24 (26.08%)

Placental location

In respect to placental location in the current study, the result was as following; 65.21% were anterior and 34.78% were posterior.

Table 5. Placental location

Placental location	No. (%)
Anterior	60 (65.21%)
Posterior	32 (34.78%)

Mode of delivery

Regarding the mode of delivery, all the patients in the present study had C/S. About 56.52% of the patients had elective C/S and about 43.47% had emergency C/S.

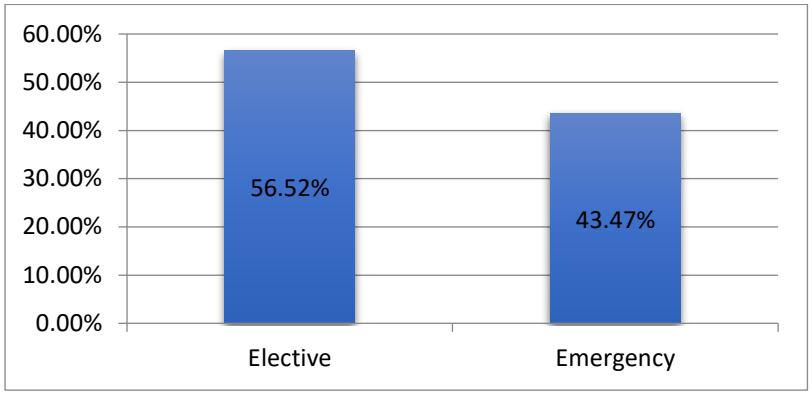

Figure 3. Mode of delivery

Maternal complications

Maternal complications in this study were as following; 75% needed blood transfusion, 15.21% had tubal ligation, 21.73% had hysterectomy, 34.78% admitted to the ICU and 2.17% maternal death.

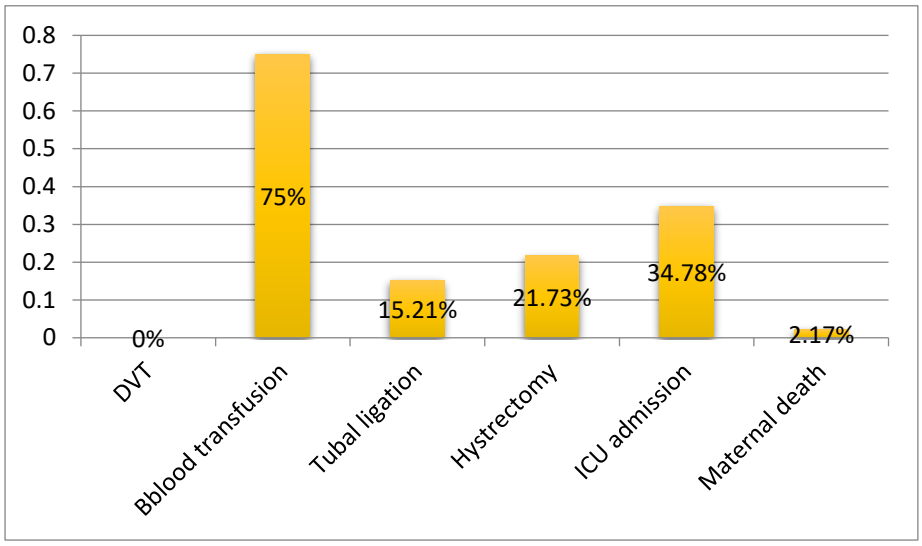

Figure 4. Maternal complications

Neonatal gender

The current study reported that about 59.78% of the placenta previa patients had male baby and 40.21% had female baby. The male to female ratio is almost 1.4:1.

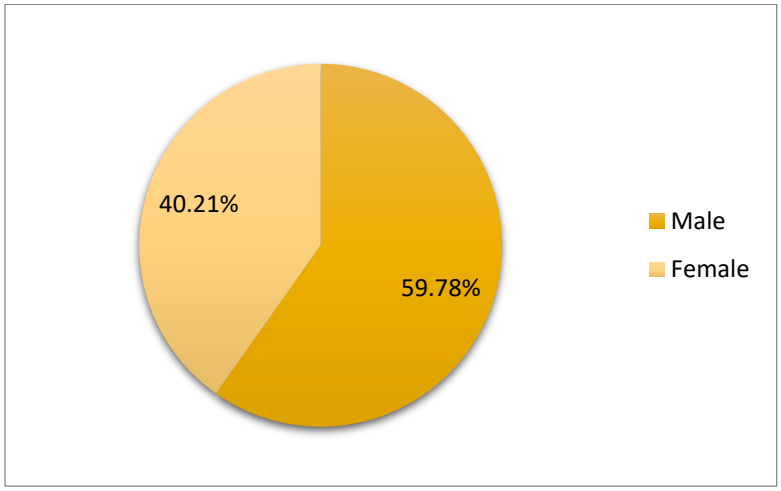

Figure 5. Neonatal gender

Gestational age at delivery

With regards the gestational age in the current study, approximately 61.95% of the patients were at term (> 36 weeks). The percentage of preterm cases was 38.04%. The gestational age in this study ranged between 30 and 39 weeks.

Table 6: Gestational age at delivery

Gestational age at delivery	No. (%)
Preterm	35 (38.04%)
Term	57 (61.95%)

Neonatal outcome

Regarding neonatal outcome, the study reported that 25% of the neonates had low birth weight, 9.78% had Apgar Score < 7 at 5 minutes, 22.82% had RDS, 23.91% were admitted to the NICU and 3.26% early neonatal death.

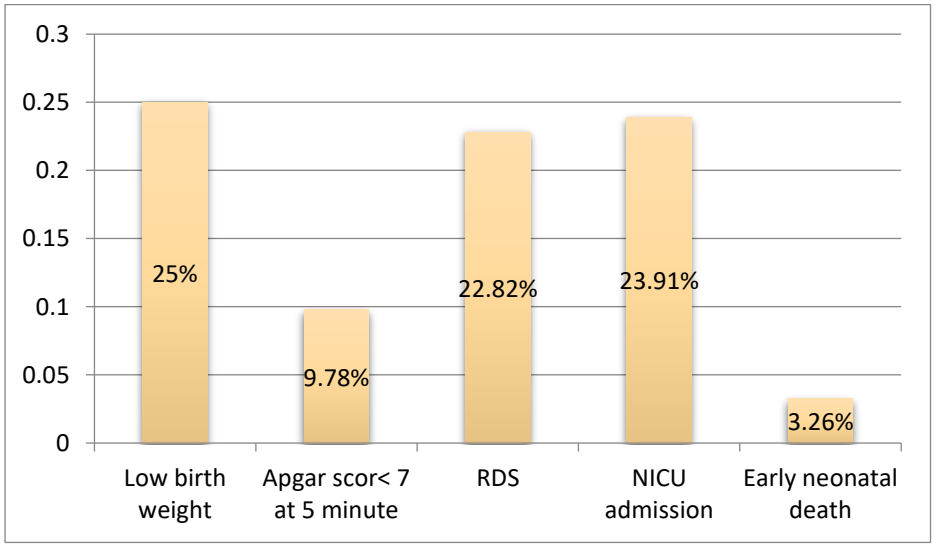

Figure 6. Neonatal outcomes

DISCUSSION

Placenta previa is one of the main causes of vaginal bleeding in the third trimester, and a significant cause of maternal and perinatal morbidity and mortality. Although the clinical course of PP is highly suggestive, the etiology of this condition still remains obscure. The strongest connection was found between previous history of C/S, high parity, and advanced maternal age, but the strength of the connection varies from study to study. Other potential risk factors with more confounding effect on the development of PP include history of previous spontaneous or induced abortions, increasing number of previous C/S, previous uterine operations, previous P P, multiple gestation, and child sex at birth [21]. This study investigated the association between different risk factors and adverse maternal and neonatal outcomes with P.P. The incidence of P.P observed in this study was 0.95% pregnancies. This was similar to study conducted in Thanjavur Medical College Hospital, India 0.9% [22]. However, the magnitude was higher than an incidence of 0.4%–0.5% reported in the literature [23]. There are also two previous studies that reported incidences of 1.9%, [24] and 1.3% [25]. The high incidence of PP in the present study population could be explained by the high number of referrals to the study hospital, which is a tertiary care center for high-risk pregnancies.

The result of this study reported that the mean age of the patients with placenta previa is 36.1 years and the highest percentage was between 30-35 years. The study of Tuzoviæ clearly demonstrated that women older than 30 years had more than 2.5-fold higher risk for placenta previa development. The distribution according to different age groups proved that this is the consequence of significantly higher frequency of women older than 35 years in the study group and at the same time, significantly lower frequency of women younger than 25 [21].

A study conducted by Kollmann reported that the overall mean maternal age was 31.6 years and 29.3% were older than 35 years at time of delivery [26]. The result of Bahar showed that there was no difference in maternal age between patients who had placenta previa and patients had no placenta previa [27]. This is thought to be due to atherosclerotic changes in the uterus resulting in under perfusion and infraction of the placenta, thereby increasing the size of the placenta. The current study showed that, the majority of the patients were multiparous.

This result was in congruence with studies from Tuzovic and Ilijic and Kollmann et al. that reported women with parity of two or more showed an increased risk of placenta praevia. They showed a greater risk of placenta praevia with higher parity [21,26]. This may be due to endometrial scarring at the site of prior placental attachments resulting in lower placental implantation, and another possibility may be due to atherosclerotic changes of blood vessels, which lead to decreased uteroplacental blood flow, which in turn leads to large placenta encroaching on the cervical os with repeated pregnancies. Other study by UstaIM et al study reported that parity and gravidity were not risk factors for placenta previa and only 27% of the patients with placenta previa were multiparous [28].

This study found that although a significant number of women had previous history of abortion about 35%. Tuzovic and Ilijic reported that the percentage of previous abortions was significantly higher among women with placenta praevia, which yielded a risk of 2.75. The mechanism of how previous abortions predispose to PP development could be explained with possible endometrial damage during repeated abortions, which impedes successful fundal implantation of the placenta [21].

The result of the current study showed that the potential risk factors for placenta previa was previous cesarean section 88.04%. Most studies have reported an association between previous caesarean section and placenta praevia. Similarly, in a meta-analysis of 170640 pregnant women, a pattern of risk factors for placenta praevia was found with the increasing number of caesarean section deliveries [29].

Another cohort study in a United Kingdom NHS hospital found that 4332 women had placenta praevia at term, accounting for 32.9 per 1000 elective CS [30]. This is because surgical disruption of the uterine cavity is known to cause lasting damage to the myometrium and endometrium. If a previous caesarean section is performed, there is a problem of angiogenesis in the previous operation site that may cause partial hypoxia. This hypoxia leads to incomplete decidualization and abnormal trophoblast invasion that can cause placental adhesion [31].

On contrary Tuzoviæ study showed that the percentage of previous cesarean sections were significantly low compared to the present study [21]. The result of the current study showed that the highest percentage of placental type 43.47% type III. The result Lvanykumari study showed the highest percentage 45% type II [32], and Raja Rajeshwari showed the highest percentage 37% type II [22].

With regards the placental location, the study showed that anterior placenta (65.21%) was more common than posterior placenta. The result of Gorodeski et al study showed that the highest percentage of placental location was centralis followed by anterior then posterior location [33]. Maternal complications in this study were as following; 75% needed blood transfusion, 34.78% admitted to the ICU, 21.73 had hysterectomy, 15.21% had tubal ligation, and 2.17% maternal death.

The result of Lavanyakumari reported that about 80.32% needed blood transfusion [32]. The study result of Gorodeski et al reported that maternal complications were as following; about 2% had massive bleeding, 1.25% had blood transfusion, 2.5% had PPH, and 1.5% had DIC [33].
Bahar study reported that maternal complications in patients with placenta previa were as following; 11.5% of the patients had massive blood loss, about 10.5% needed blood transfusion, 3% had hysterectomy, 1.5% had visceral injury, 30% had PPH and 0.8% had DIC [27]. Regarding neonatal outcome, 59.71% of the neonate were males, this result was in congruence with study from Ojha N study reported that 57.1% of the neonate were males [10], while Ashete Adere showed that the highest percentage of neonates born to a placenta previa case were males 65.3% [34]. The study reported that 25% of the neonates had low birth weight, 38.04% premature, 22.82% had RDS, 3.26% had neonatal death, 9.78 had Apgar score <7 at 5 minute and 23.91% were admitted to the NICU. The result of Anzaku AS reported that about 8% of the neonates had birth asphyxia and the overall perinatal mortality rate was 18.7% which was relatively high compared to the current study result [35]. Kollmann study showed that about 75% of the neonate were premature, 46% had low birth weight and about 10% had low Apgar score [26].

CONCLUSION

In summary, the main risk factors that cause placenta previa were multiparity, history of abortion, prior E and C, prior C/S. Maternal morbidity showed that the most prominent maternal morbidity was antenatal bleeding followed by anemia while the most prominent neonatal morbidity was low birth weight followed by IUGR. Appropriate antenatal care and counseling should be provided to all women who had risk factors for placenta previa. Other risk factors also should be studied in the future.

Disclaimer

The article has not been previously presented or published, and is not part of a thesis project.

Conflict of Interest

There are no financial, personal, or professional conflicts of interest to declare.

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