OPEN ACCESS

Scholars International Journal of Obstetrics and Gynecology

Abbreviated Key Title: Sch Int J Obstet Gynec
ISSN 2616-8235 (Print) | ISSN 2617-3492 (Online)
Scholars Middle East Publishers, Dubai, United Arab Emirates
Journal homepage: https://saudijournals.com

Original Research Article

Postpartum Hemorrhage and Perineal Injury in VBAC: A Study of 100 Cases at Dhaka Medical College Hospital

Dr. Umme Aysha Kashfee[1]*, Dr. Ahamed Shammi Asif[2], Dr. Nasrin Akhter[3], Dr Nazneen Sultana[4], Dr. Niva Rani Das[5]

[1]Assistant Surgeon, Directorate General of Health Services, Dhaka, Bangladesh
[2]CEO & Founder, Master The MRCOG, Dhaka, Bangladesh
[3]Medical Officer, Sir Salimullah Medical College Mitford Hospital, Dhaka, Bangladesh
[4]Medical Officer, Sir Salimullah Medical College Mitford Hospital, Dhaka, Bangladesh
[5]Junior Consultant, Obstetrics and Gynaecology, Upazila Health Complex, Gabtali, Bogura, Bangladesh

DOI: https://doi.org/10.36348/sijog.2026.v09i05.002 | **Received:** 17.03.2026 | **Accepted:** 11.05.2026 | **Published:** 16.05.2026

***Corresponding author:** Dr. Umme Aysha Kashfee
Assistant Surgeon, Directorate General of Health Services, Dhaka, Bangladesh

Abstract

Background: Rising caesarean section rates and concerns regarding maternal safety continue to shape modern obstetric practice, especially in low-resource settings. Therefore, this study assessed postpartum hemorrhage and perineal injury among women undergoing VBAC at Dhaka Medical College Hospital. ***Methods:*** This cross-sectional study was conducted in the Department of Obstetrics and Gynaecology, Dhaka Medical College Hospital (DMCH), Dhaka, Bangladesh, from 16 April to 15 October 2023, enrolling 100 pregnant women with one or two prior caesarean sections planned for vaginal delivery. After ethical approval and informed consent, data were collected with a structured questionnaire, and women undergoing trial of labour after caesarean (TOLAC) were monitored using maternal and fetal parameters, partogram, and oxytocin as per protocol. Outcomes included induction-to-delivery interval, mode of delivery, and maternal complications, and data were analyzed in SPSS. ***Results:*** Among 100 VBAC cases, mean age was 29.8 ± 11.4 years, with most aged 20–30 years (58.0%) and 82.0% at ≥37 weeks gestation. Hemoglobin ≥11 g/dL was seen in 72.0%, and membrane status was nearly equal (intact 52.0%, ruptured 48.0%). Mean induction–delivery interval was 8.37 ± 5.3 hours, with 64.0% delivering within 7–12 hours. VBAC success was 76.0% and repeat caesarean 24.0%. Overall, 83.0% had no complications; PPH occurred in 9.0%, perineal injury in 3.0%, and no uterine rupture was noted. ***Conclusion:*** VBAC is a safe and effective mode of delivery in appropriately selected women, with low rates of postpartum hemorrhage and perineal injury.

Keywords: Postpartum Hemorrhage, Perineal Injury, VBAC.

INTRODUCTION

In recent decades, caesarean section has become one of the most frequently performed obstetric procedures across the world, with a continuous upward trend in its use. Over the last twenty years, global caesarean delivery rates have increased substantially, rising from approximately 5% to over 20% [1], and from around 7% in 1990 to nearly 21% in more recent estimates, with expectations of further increase in the future. This rising trend has led to ongoing discussions regarding the appropriate caesarean section rate that balances maternal and neonatal safety. Determining an optimal rate of caesarean delivery and ensuring safe childbirth practices remain important challenges in obstetric care [2], particularly in low-resource settings where maternal morbidity and mortality continue to be major public health concerns. In countries such as Bangladesh, complications related to pregnancy and childbirth are still among the leading causes of death in women of reproductive age [3,4], highlighting the continued need for improved obstetric care and outcomes.

In this context, vaginal birth after caesarean (VBAC) has gained importance as a strategy to reduce the rising number of repeat caesarean deliveries. The previously accepted belief that "once a caesarean, always a caesarean" is no longer considered appropriate [5], and planned vaginal birth after a prior caesarean section is now recommended in carefully selected cases [6].

VBAC is widely accepted as a safe and favourable option for many women with a previous caesarean delivery [7,8], offering several advantages such as avoidance of major abdominal surgery, reduced operative risks, lower chances of infection, decreased exposure to anaesthesia, and quicker postpartum recovery [9]. In this way, VBAC helps to reduce the overall burden associated with repeat caesarean sections and contributes to improved maternal health outcomes.

However, VBAC is not completely risk-free and continues to be an area of clinical concern and debate. Trial of labour after caesarean (TOLAC) requires careful evaluation because of potential maternal complications, including postpartum hemorrhage (PPH), uterine rupture, and perineal injury [10] In addition, caesarean delivery itself is associated with greater intraoperative blood loss, higher likelihood of uterine atony, and postoperative complications, all of which contribute to increased hemorrhagic risk [11]. Although uterine rupture is uncommon and the risk of complications varies depending on individual obstetric factors, VBAC still necessitates careful intrapartum monitoring to ensure the safety of both mother and fetus [12]. Therefore, appropriate case selection and continuous surveillance during labour are essential components of safe VBAC practice.

Among the complications of concern, postpartum hemorrhage remains one of the most significant obstetric emergencies worldwide and continues to be a leading cause of preventable maternal morbidity and mortality [13]. It contributes substantially to maternal deaths globally and occurs in a notable proportion of pregnancies, making its prevention and timely management a major priority in maternal healthcare. Similarly, perineal injury is a commonly encountered complication of vaginal delivery and is influenced by multiple factors including labour progression, fetal characteristics, and obstetric history [14]. The process of labour itself involves progressive uterine contractions and cervical dilatation, which may result in varying degrees of trauma to the genital tract. As such, both postpartum hemorrhage and perineal injury serve as important indicators of maternal safety and are critical outcomes to evaluate in women undergoing VBAC.

Although multiple international studies have assessed maternal outcomes following VBAC, including haemorrhagic complications and perineal trauma, the reported findings vary across different populations and healthcare systems. In low- and middle-income countries such as Bangladesh, there remains limited institutional data on the incidence and pattern of these complications among women undergoing VBAC. Local evidence is therefore essential to better understand maternal risks in this setting and to guide safe and effective clinical decision-making during trial of labour after caesarean [15]. Accordingly, the present study was undertaken to assess postpartum hemorrhage and perineal injury among women undergoing VBAC at Dhaka Medical College Hospital.

Despite the rising global and regional rates of caesarean section and the increasing acceptance of vaginal birth after caesarean (VBAC) as an alternative to repeat surgery, evidence on maternal outcomes remains inconsistent, particularly regarding postpartum hemorrhage (PPH) and perineal injury. Available studies report variable incidences of these complications, influenced by differences in patient selection, intrapartum management, and healthcare settings. However, there is limited context-specific evidence from Bangladesh, especially from tertiary care hospitals, regarding the burden of these maternal complications following VBAC. This gap highlights the need for local data to better understand maternal safety outcomes in VBAC. Therefore, this study was undertaken to assess postpartum hemorrhage and perineal injury among women undergoing VBAC at Dhaka Medical College Hospital.

Objective

- To assess postpartum hemorrhage and perineal injury among women undergoing vaginal birth after caesarean (VBAC) at Dhaka Medical College Hospital.

METHODOLOGY & MATERIALS

This observational, non-interventional descriptive cross-sectional study was conducted in the Department of Obstetrics and Gynaecology, Dhaka Medical College Hospital (DMCH), Dhaka, Bangladesh, over a period of six months from 16th April 2023 to 15th October 2023. A total of 100 pregnant women with a previous history of one or two caesarean sections and planned for vaginal delivery in the current pregnancy were included in the study after fulfilling the predefined inclusion and exclusion criteria.

Inclusion criteria

i. Pregnant women with a previous history of one or two caesarean sections planned for vaginal birth
ii. Singleton pregnancy with longitudinal lie and cephalic presentation
iii. Gestational age ≥34 weeks
iv. Live fetus

Exclusion criteria

i. Previous caesarean section due to recurrent indication
ii. History of more than two caesarean sections
iii. Malpresentation (e.g., face presentation)
iv. Malposition (transverse lie)
v. Women unwilling to participate

Vaginal birth was defined as delivery of the fetus through the vaginal route, while caesarean section

referred to delivery through abdominal and uterine incision. Vaginal birth after caesarean (VBAC) was defined as vaginal delivery following a previous caesarean section, with successful VBAC referring to vaginal delivery after a trial of labour and failed VBAC indicating repeat caesarean section after trial of labour. Maternal outcomes included postpartum hemorrhage, perineal injury, wound infection, and uterine rupture.

Eligible women with a previous caesarean section admitted for delivery were recruited after obtaining informed written consent, and relevant obstetric and demographic data were collected using a pre-tested structured questionnaire. Women undergoing trial of labour after caesarean (TOLAC) were continuously monitored, including assessment of maternal vital signs, fetal heart rate, uterine contractions, and labour progress, with support from a partogram. Labour induction and augmentation were performed according to hospital protocol using oxytocin when indicated. Recorded outcomes included induction-to-delivery interval, mode of delivery, and maternal complications such as postpartum hemorrhage, perineal injury, wound infection, and uterine rupture.

The primary outcomes were postpartum hemorrhage and perineal injury, while secondary outcomes included mode of delivery and other maternal complications. Data were coded, entered, and analyzed using SPSS software. Results were presented in tables and figures, and statistical significance was set at $p < 0.05$. A pre-tested structured questionnaire was used to ensure data quality, and supervision along with pilot testing was performed to maintain consistency and minimize bias. Ethical approval was obtained from the Ethical Review Committee of Dhaka Medical College Hospital, and written informed consent was obtained from all participants, with strict maintenance of confidentiality and anonymity.

RESULTS

Table 1: Baseline Clinical Characteristics of Women Undergoing VBAC (n = 100)

Variable	Category	Frequency (n)	Percentage (%)
Age group (years)	20–30	58	58.0
	31–40	36	36.0
	>40	6	6.0
	Mean ± SD (years)	29.8 ± 11.4	
Gestational age (weeks)	<37	18	18.0
	≥37	82	82.0
Hemoglobin level (g/dL)	≥11	72	72.0
	<11	28	28.0
Membrane status	Intact	52	52.0
	Ruptured	48	48.0

The majority of women were aged 20–30 years (58 patients, 58.0%), followed by 31–40 years (36 patients, 36.0%), and >40 years (6 patients, 6.0%), with a mean age of 29.8 ± 11.4 years. Most participants had a gestational age ≥37 weeks (82 patients, 82.0%), while 18 patients (18.0%) delivered before 37 weeks. Regarding hemoglobin status, 72 patients (72.0%) had hemoglobin ≥11 g/dL, whereas 28 patients (28.0%) were anemic (<11 g/dL). Membrane status was almost equally distributed, with intact membranes in 52 patients (52.0%) and ruptured membranes in 48 patients (48.0%).

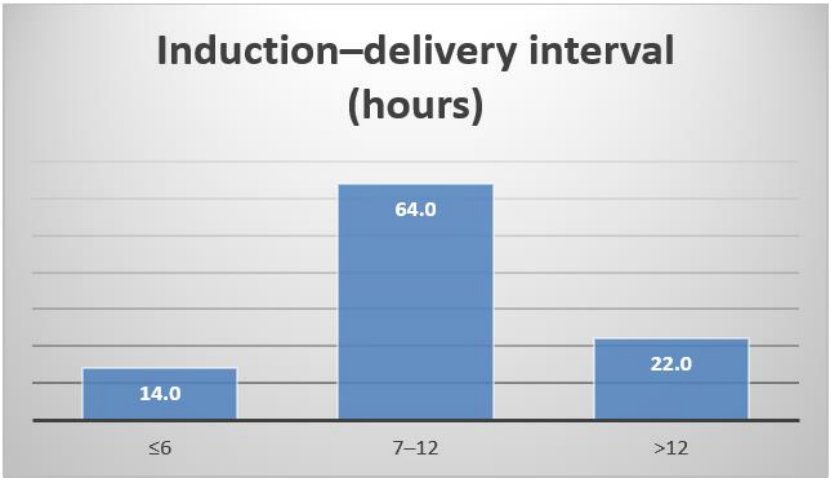

Figure 1: Induction-to-Delivery Interval Among Women Undergoing VBAC (n = 100)

The induction-to-delivery interval was ≤6 hours in 14 patients (14.0%), 7–12 hours in 64 patients (64.0%), and >12 hours in 22 patients (22.0%). The mean induction-to-delivery interval was 8.37 ± 5.3 hours.

Table 2: Mode of Delivery Following Trial of Labour in Women with Previous Caesarean Section (n = 100)

Delivery outcome	Frequency (n)	Percentage (%)
Vaginal delivery (VBAC)	76	76.0
Repeat caesarean section	24	24.0

Successful vaginal birth after caesarean (VBAC) was achieved in 76 patients (76.0%), while 24 patients (24.0%) underwent repeat caesarean section following failed trial of labour.

Table 3: Maternal Outcomes Following Vaginal Birth After Caesarean (VBAC) (n = 100)

Maternal outcome	Frequency (n)	Percentage (%)
No complication	83	83.0
Wound infection	5	5.0
Uterine rupture	0	0.0
Postpartum hemorrhage (PPH)	9	9.0
Perineal injury	3	3.0

The majority of women experienced no complications (83 patients, 83.0%). Postpartum hemorrhage (PPH) occurred in 9 patients (9.0%), perineal injury in 3 patients (3.0%), and wound infection in 5 patients (5.0%). No cases of uterine rupture were observed.

DISCUSSION

In this cross-sectional study conducted at the Department of Obstetrics and Gynaecology, Dhaka Medical College Hospital, maternal outcomes following vaginal birth after caesarean (VBAC) were evaluated among women with a previous history of caesarean section. A high rate of successful VBAC was observed, with most women experiencing no maternal complications, while postpartum hemorrhage and perineal injury occurred in a small proportion of cases, suggesting that VBAC can be a safe option in appropriately selected and closely monitored patients.

The baseline clinical characteristics of women undergoing VBAC in the present study demonstrate patterns that are largely comparable with previously reported findings in the literature. The majority of participants belonged to the 20–30-year age group (58.0%), with a mean age of 29.8 ± 11.4 years, which is consistent with the observations of Zhou *et al.,*[16], who reported that most women undergoing VBAC fall within the 20–35-year reproductive age range. This reflects the typical reproductive demographic in which VBAC is most commonly attempted. Similarly, a predominance of term pregnancies was observed in our cohort, with 82.0% of women delivering at ≥37 weeks of gestation, which is also in agreement with Zhou *et al.,*[16], where VBAC is more frequently attempted at term, likely due to improved fetal maturity and safer labour conditions.

Regarding hematological status, 28.0% of women in our study were found to be anaemic (Hb <11 g/dL), which is comparable to the 38% prevalence reported by Fenn *et al.,* [17], who further highlighted anaemia as an important contributing factor associated with postpartum hemorrhage. This similarity underscores the clinical importance of evaluating baseline haemoglobin status in women undergoing VBAC, as it may have direct implications on maternal outcomes such as blood loss during delivery. In addition, membrane status was almost equally distributed between intact (52.0%) and ruptured (48.0%) membranes, reflecting a typical intrapartum profile seen in VBAC populations, where both spontaneous and progressed labour presentations are commonly encountered. Overall, the baseline characteristics of our study population closely mirror established VBAC cohorts and provide a clinically relevant foundation for interpreting subsequent maternal outcomes, particularly postpartum hemorrhage and perineal injury.

The induction-to-delivery interval observed in the present study demonstrated a pattern consistent with previously reported labour dynamics in VBAC populations. The mean duration was 8.37 ± 5.3 hours, with the majority of women (64.0%) delivering within 7–12 hours following induction. This finding closely aligns with Wu *et al.,*[18], who reported a total labour duration of approximately 450 minutes (~7.5 hours) in VBAC induction cases and noted that the first stage of labour contributes significantly to overall duration without a corresponding increase in postpartum hemorrhage or perineal injury. Similarly, Rusavy *et al.,*[19] reported a first-stage labour duration of approximately 289 minutes (~4.8 hours) and emphasized that although labour duration is an important determinant of genital tract trauma, including perineal injury, VBAC labour patterns generally remain within predictable and clinically manageable time frames. The findings of the present study therefore fall within the expected physiological range of labour progression in VBAC and suggest that a controlled induction-to-delivery interval may contribute to favorable maternal outcomes,

including acceptable rates of postpartum hemorrhage and perineal injury.

The present study demonstrated a VBAC success rate of 76.0%, with 24.0% of women requiring repeat caesarean section following a trial of labour. This finding is consistent with the large evidence review by Guise *et al.,*[20], which reported VBAC success rates ranging from 60% to 82%, with a pooled average of approximately 75.9%, closely matching the results of the current study. Similarly, Barnea *et al.,*[21] reported international VBAC success rates of 74.7% in the USA and 76.6% in Canada, with an overall range of 60–80% across different regions, further reinforcing the comparability of our findings with global data. The repeat caesarean section rate of 24.0% observed in this study therefore lies well within the expected range of failed trial of labour after caesarean as described in the literature. Collectively, these similarities indicate that the VBAC success rate in the present study reflects standard clinical outcomes observed in appropriately selected candidates and is consistent with internationally reported evidence.

The maternal outcomes observed in the present study following VBAC demonstrate patterns that are in agreement with previously published literature. Postpartum hemorrhage (PPH) occurred in 9.0% of cases, which is comparable to the findings of Lan *et al.,*[22], who reported a PPH rate of approximately 6.6% in VBAC populations and noted increased blood loss compared with control groups, while still concluding that VBAC is associated with measurable but acceptable maternal morbidity. Similarly, perineal injury was observed in 3.0% of cases in the present study, which corresponds with findings from the population cohort study by Uebergang *et al.,*[23], where severe perineal tear rates were reported as 7.1% in VBAC compared with 5.7% in non-VBAC controls, indicating a modest but increased risk of genital tract trauma associated with VBAC. Furthermore, Opondo *et al.,*[24] reported that perineal trauma is common in vaginal deliveries, occurring in up to 80–85% of cases, with severe tears (OASIS) occurring in approximately 3–8% of women, supporting the variability and expected occurrence of such injuries in vaginal birth settings. In the present study, the majority of women (83.0%) experienced no complications, and notably, no cases of uterine rupture were observed. These findings collectively reinforce the existing evidence that VBAC, when appropriately selected and managed, is generally safe and is associated with a low but predictable rate of maternal morbidity, primarily in the form of postpartum hemorrhage and perineal injury.

Limitations of the study

This study has several limitations, which should be considered when interpreting the findings:

- The study was conducted with a relatively small sample size, which may limit the generalizability of the findings.
- As a single-center study conducted at Dhaka Medical College Hospital, the results may not reflect the broader population at the national level.
- Being carried out in a tertiary care hospital, the findings may not be representative of outcomes in primary or secondary healthcare settings.
- The use of purposive sampling may introduce selection bias, potentially affecting the external validity of the study.

CONCLUSION

Vaginal birth after caesarean section is an important obstetric option that offers an opportunity to reduce repeat surgical deliveries while ensuring maternal safety. This study found that VBAC was generally associated with favourable outcomes, with most women experiencing no complications. Postpartum hemorrhage and perineal injury were observed in a small proportion of cases, while the majority had an uncomplicated recovery. Overall, VBAC appears to be a relatively safe mode of delivery in appropriately selected women, with low rates of significant maternal morbidity.

REFERENCES

1. Mukherjee SN. Rising cesarean section rate. J Obstet Gynecol India. 2006 Jul 1;56(4):298-300.
2. Birth after previous caesarean birth. In: Greentop guideline. 2015.
3. Kusiako T, Ronsmans C, Van der Paal L. Perinatal mortality attributable to complications of childbirth in Matlab, Bangladesh. Bulletin of the World Health Organization. 2000; 78:621-7.
4. Fatema K, Ghani T, Paul SK, Begum A, Hussain T. A clinical study of labour and outcome in hundred cases of primigravida in Dhaka medical college and hospital. Journal of Dhaka Medical College. 2018 Nov 19;27(1):9-13.
5. World Health Organization. Appropriate technology for birth. Lancet. 1985; 2:436-7.
6. Vbac Catalin S, Buhimschilrnia A, Patel BS, Andrew M, Weiner P. Rupture of the uterine scar during term labour: contractility or biochemistry? SOGC clinical practice guidelines for. 2005;112.
7. Obstetric guideline 8: vagina l birth after previous Caesarea n birth. J SocObstetGynaecol Can. 1997;19.
8. Sadieyaz R, Mitra A. Assessment of normal vaginal birth after cesarean section and its effect on pregnancy outcomes. Iran J ObstetGynecolInfertil. 2005;8(2).
9. Creswell J. Research design: Qualitative, quantitative and mixed methods. Sage Publications.; 2003.
10. Vedadhir AA, Hossein Nejad F, Hani Sadati SM, Taghavi S. Childbearing as a socio-cultural problem: A realistic reflection on cesarean section. Iran J Anthropol Res. 2012;1(2):111-35.

11. Say L, Chou D, Gemmill A, Tunçalp Ö, Moller AB, Daniels J, Gülmezoglu AM, Temmerman M, Alkema L. Global causes of maternal death: a WHO systematic analysis. The Lancet global health. 2014 Jun 1;2(6): e323-33.
12. Philpott RH, Castle WM. Cervicographs in the management of labour in primigravidae. I. The alert line for detecting abnormal labour: I. The Alert Line for detecting abnormal labour. J Obstet Gynaecol Br Commonw [Internet]. 1972;79(7):592–8.
13. World Health Organization. WHO recommendations for the prevention and treatment of postpartum haemorrhage. World Health Organization; 2012.
14. Hosseinzadeh M, Heshmatkhah E, Abtahi D. Prevalence and risk factors of postpartum hemorrhage in cesarean section: A retrospective cohort study. Journal of Obstetrics, Gynecology and Cancer Research. 2023 May 23;8(3):285-94.
15. Thompson W, Harper MA. Postpartum haemorrhage and abnormality of third stage of labour. Chamberlain G, Steer P, editors. Churchill Livngstone. 2001;619–33.
16. Zhou P, Guo X. Comparison of maternal and neonatal outcomes between vaginal birth after cesarean section and normal vaginal birth. J Matern Fetal Neonatal Med. 2024 Dec;37(1):2399942.
17. Fenn MG, Al Falahi M, Al Hannai T, Al Shukaili L, Al Riyami N. Postpartum Hemorrhage Following Vaginal and Cesarean Section Deliveries at a Single Tertiary Hospital: A Five-year Cross-sectional Study. Oman Med J. 2024 Nov 30;39(6): e695.
18. Wu SW, Liu XW, Chen Y, Wang X, Zhang WY. [Effect of induction on maternal and neonatal outcomes of vaginal birth after cesarean]. Zhonghua Yi Xue Za Zhi. 2020 Jul 7;100(25):1979-1982.
19. Rusavy Z, Francova E, Paymova L, Ismail KM, Kalis V. Timing of cesarean and its impact on labor duration and genital tract trauma at the first subsequent vaginal birth: a retrospective cohort study. BMC pregnancy and childbirth. 2019 Jun 20;19(1):207.
20. Guise JM, McDonagh MS, Hashima J, Kraemer DF, Eden KB, Berlin M, *et al.,* Vaginal birth after cesarean (VBAC): Summary. Agency for Healthcare Research & Quality; 2003.
21. Barnea ER, Ramasauskaite D, Ubom AE, Di Simone N, Mueller M, Borovac-Pinheiro A, Guarano A, Benedetto C, Beyeza-Kashesya J, Nunes I, Jacobsson B, Wright A; FIGO Childbirth and Postpartum Hemorrhage Committee. FIGO good practice recommendations for vaginal birth after cesarean section. Int J Gynaecol Obstet. 2025 Oct;171(1):17-31.
22. Lan Y, Pan S, Chen B, Peng L, Chen R, Hua Y, Ma Y. Labor characteristics and intrapartum interventions in women with vaginal birth after cesarean section. BMC Pregnancy and Childbirth. 2022 Jul 23;22(1):589.
23. Uebergang J, Hiscock R, Hastie R, Middleton A, Pritchard N, Walker S, Tong S, Lindquist A. Risk of obstetric anal sphincter injury among women who birth vaginally after a prior caesarean section: A state-wide cohort study. BJOG. 2022 Jul;129(8):1325-1332.
24. Opondo C, Harrison S, Sanders J, Quigley MA, Alderdice F. The relationship between perineal trauma and postpartum psychological outcomes: a secondary analysis of a population-based survey. BMC pregnancy and childbirth. 2023 Sep 6;23(1):639.