

Vaginal Birth after Cesarean (VBAC) in the 1980s

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Abstract: The incidence of vaginal birth after cesarean (VBAC) and characteristics of VBAC births are investigated using 1980–85 National Hospital Discharge Survey Data collected by the National Center for Health Statistics. Only 3.4 per cent of mothers with previous cesarean delivery had VBAC in their subsequent 1980 delivery; this increased to 6.6 per cent in 1985. Because VBAC is a relatively infrequent event, 1980–85 data were combined and indicate that in this period 4.9 per cent of mothers with previous cesarean had a vaginal birth in their subsequent delivery. Combined 1980–85 VBAC rates are under 10 per cent for all age, race, marital status, region, hospital size, hospital ownership, and expected source of payment groups. Between 1980 and 1985, over 1.4 million repeat cesareans were performed for mothers having a live birth. Evidence

suggests that potentially over 500,000 of these repeat cesareans could have been VBACs (over and above the 74,000 VBACs which occurred). VBAC mothers' mean length of hospital stay is 3.2 days, which compares closely with 3.0 days for other vaginal deliveries, but both contrast sharply with 5.6 days for repeat cesareans and 6.0 days for primary cesareans. Except for the uterine scar from the previous cesarean, VBAC mothers appear to have about the same history and frequency of complications as mothers with other vaginal deliveries. If the 500,000 repeat cesareans had been VBACs, surgical fees and costs for 1.2 million days of hospital stay would have been averted over the 1980–85 period. (*Am J Public Health* 1988; 78:512–515.)

Introduction

The cesarean rate rose dramatically from 4.5 per 100 deliveries in 1965 to 16.5 in 1980,¹ when in September the National Institutes of Health convened a Consensus Development Conference on Cesarean Childbirth.² The Consensus Conference recommended that trial of labor be attempted for women with previous cesareans because it was safe, would attenuate the rapidly rising cesarean rate, and would make inroads into the obsolete but widely adhered to obstetrical norm of "once a cesarean, always a cesarean." Reports of the conference were published early in 1981 in two major obstetrical journals.^{3,4} Still, the rate of cesareans per 100 deliveries continued to rise steadily to 17.9 in 1981, 18.5 in 1982, 20.3 in 1983, and 21.1 in 1984.⁵ In 1984, the short-term failure of the consensus conference to stem the rising cesarean rate was declared.⁶ Meanwhile, in 1982, the American College of Obstetricians and Gynecologists (ACOG) issued guidelines to decrease the rate of repeat cesareans,⁷ and further liberalized these guidelines to promote trial of labor and vaginal birth after cesarean in 1985.⁸ ACOG's then-president, Dr. Luella Klein, stated that: "Mortality fears for mother and infant due to rupture of the uterus in trial of labor are unjustified by present statistical data. As far as is known, no mother has died due to trial of labor in recent years, regardless of scar type."⁹ In 1985, the cesarean rate rose again to 22.7 cesareans per 100 deliveries,¹⁰ and an analysis of the 1980–85 rise indicated that the most important contributor to the increase between 1980 and 1985 was previous cesarean delivery, which accounted for 48 per cent of the rise.¹¹ This reflects the 65 per cent increase between 1980 and 1985 in the proportion of all women giving birth who had a previous cesarean delivery (from 5.1 per cent to 8.4 per cent). Thus, the pool of women eligible for VBAC is growing.

Nevertheless, several studies indicate limited VBAC rates in the United States. A longitudinal study which linked New York State birth certificates found that of 3,452 mothers who had a primary cesarean in 1975 and who gave birth again within the next five years, only 2.6 per cent had VBAC

deliveries—the other 97.4 per cent had repeat cesareans.* In a study of nearly 500 hospitals, Shiono, et al, found the prevalence of VBAC to be 1.3 per cent in 1979 and 4.8 per cent in 1984¹²; in 1984, only 8.0 per cent of women with a prior cesarean delivery had trial of labor but, of these, 51.0 per cent had a successful VBAC. Shiono also found that hospitals with more deliveries (which may or may not be determined by hospital size) were more likely to offer trial of labor. International comparisons, and hospital and clinical practice studies in this country show that rates of 40 to 80 VBACs per 100 previous cesareans are attainable. For example, VBAC rates of 32, 39, 41, and 43 per 100 previous cesareans for Hungary, Scotland, Bavaria, and Norway, respectively, were recently reported in cross-national comparisons of cesarean section rates.¹³ In the United States, numerous hospital and clinical studies have shown VBAC rates of 39 to 89 to be safely attainable for women allowed a trial of labor.^{14–20}

Tahilramaney, et al,²¹ found that of 308 patients with previous cesarean who were given a trial of labor, only 1.9 per cent experienced uterine dehiscence (silent separation of the uterine scar when the separation was not diagnosed or suspected before surgery). Lavin, et al,²² reviewed 25 detailed VBAC and trial of labor studies conducted from 1950 through 1980 and concluded:

"Vaginal delivery after cesarean section appears to be relatively safe . . . an increasing number of vaginal deliveries among patients previously delivered by cesarean section may be expected to reduce medical costs substantially."²²

Thus, VBAC remains low in the United States because of infrequent trials of labor, not because of infrequent successes when trials are attempted. For this reason, and because of VBAC's potential to reduce the many thousands of repeat cesareans which occur annually, we undertook a closer look at this relatively infrequent obstetrical phenomenon using nationally representative data.

Methods

Data on discharges from short-stay hospitals are collected annually by the National Center for Health Statistics

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(NCHS) in the National Hospital Discharge Survey (NHDS). Medical and demographic information recorded on the face sheets of medical records is abstracted from a yearly sample of over 200,000 inpatients discharged from more than 400 non-federal general and special short-stay hospitals that participate in the surveys. Data are coded according to the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM). The statistical design, data collection, quality control procedures, measurement and sampling errors, and an evaluation of the data collection procedures of the NHDS have been published.^{23,24} The present analysis is based on combined 1980-85 data for nearly 10 per cent of the NHDS sample abstracts—women discharged after delivery. About 20,000 discharges after delivery are included annually in the NHDS, so the present study is based on about 120,000 deliveries. Numbers are statistically weighted to be nationally representative estimates of VBAC rates for US hospital deliveries.

Using ICD-9-CM, deliveries in 1980-85 were classified and grouped according to type of delivery. Deliveries were classified as "VBAC" if a uterine scar from previous surgery (ICD-9-CM code 654.2) was indicated on the medical record and the present delivery was not by cesarean section. Similarly, deliveries were identified as repeat cesareans if the medical record showed a previous uterine scar and the present delivery was by cesarean section.

Results

Cesareans continued to rise dramatically during the first half of this decade—from an estimated 596,000 cesareans for live births in 1980 to 851,000 in 1985 (Table 1). Repeat cesareans accounted for 30 per cent (178,000) of all cesareans in 1980, but 35 per cent (294,000) of all cesareans in 1985. Over the 1980 to 1985 period, there were 1,436,000 repeat cesareans, but only 74,000 VBACs. The VBAC rate rose from 3.4 vaginal deliveries per 100 mothers with previous cesarean in 1980 to 6.6 in 1985 (Figure 1). The 1980-85 average VBAC rate was 4.9. This means that 95 per cent of the time, the "once a cesarean, always a cesarean" norm prevailed. Because VBAC is an infrequent event, the 1980-85 data years are combined to introduce greater stability for the estimates shown in Tables 2-4.

VBAC rates are low for all maternal and hospital characteristics (Table 2). The West's VBAC rate of 7.9 was the highest of all regions—higher than the 4.8 rate of the Northeast, the 4.3 VBAC rate of the Mideast, or the 3.8 rate of the South. VBAC rates were calculated for four expected

TABLE 1—Number of Live Births by type of Delivery: United States, 1980-85

Year	Total ^a	Cesarean ^b Total	Repeat ^b Cesarean	Primary ^b Cesarean	VBAC ^c	Other ^b Vaginal
Total 1980-85	21,979	4,291	1,436	2,855	74	17,614
1985	3,749	851	294	557	21	2,877
1984	3,669	774	265	509	16	2,879
1983	3,639	739	257	482	12	2,888
1982	3,681	681	219	462	11	2,989
1981	3,629	650	223	427	8	2,971
1980	3,612	596	178	418	6	3,010

Sources: ^aNational vital registration data.

^bEstimated by applying National Hospital Discharge Survey (NHDS) cesarean rates to the number of live births from national vital registration data.

^cVBAC = Vaginal Birth After Cesarean. Numbers derived by applying the VBAC rate to the total number of women with previous cesarean.

NOTE: numbers in thousands

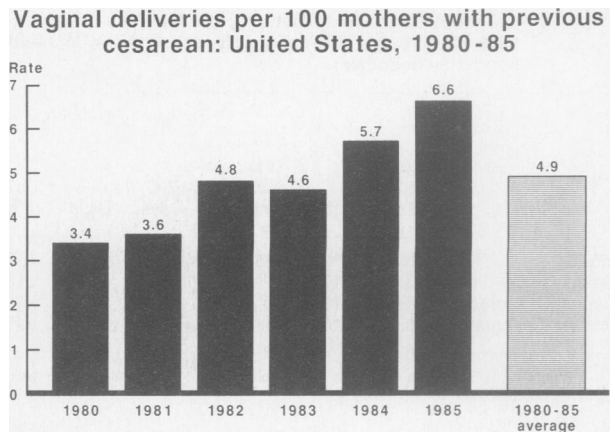


FIGURE 1—Vaginal Deliveries per 100 Mothers with Previous Cesarean: United States 1980-85

sources of payment for delivery, but only the VBAC rate of 6.9 for "self pay, no charge, and other" was substantially higher than the Blue Cross rate of 4.3. VBAC rates vary little by maternal age, race, or marital status, or by hospital size or type of ownership (Table 2). There is also a pattern of higher VBAC rates for older mothers, larger hospitals, and source of payment other than private insurance; these factors probably interact. However, limited sample size for VBAC deliveries precludes in-depth exploration of these interrelationships.

The mean length of stay was 3.2 days for VBAC

TABLE 2—VBAC Rates for Selected Maternal and Hospital Characteristics: United States, 1980-85 Average (rates are number of women with a vaginal birth following a cesarean delivery per 100 women with a previous cesarean delivery; includes only deliveries in non-federal short-stay hospitals)

Characteristics	Rate
All Women	4.9
Age of Mother	
Under 20 years	4.0*
20-29 years	4.7
30 years and over	5.6
Race of Mother	
White	5.0
Black	4.9
Marital Status	
Married	4.8
Unmarried	5.4
Region	
Northeast	4.8
Midwest	4.3
South	3.8
West	7.9
Hospital Size	
Under 100 beds	4.4*
100-499 beds	4.7
500 beds or more	5.7
Hospital Ownership	
Proprietary	4.4*
Government	5.8
Voluntary nonprofit	4.7
Expected Source of Payment	
Blue Cross	4.3
Other private insurance	4.5
Medicaid and other government	5.8
Self-pay, no charge and other	6.9

*Figure does not meet standards of reliability or precision because the weighted numerator is less than 10,000 deliveries.

TABLE 3—Length of Stay in Hospital by type of Delivery: United States, 1980–85 Average (Includes only deliveries in non-federal short-stay hospitals)

	Mean number of Days	Total	Per Cent Distribution			
			Less than 2 Days	2–3 Days	4–5 Days	6 Days or More
VBAC	3.2	100.0	11.2	59.2	21.6	8.0
Other Vaginal	3.0	100.0	10.0	65.5	21.2	3.3
Repeat Cesarean	5.6	100.0	0.2*	7.4	48.1	44.3
Primary Cesarean	6.0	100.0	0.3*	5.8	48.6	45.3

*Figure does not meet standards of reliability or precision because the weighted numerator is less than 10,000 deliveries.

TABLE 4—Per Cent Distribution of Deliveries with stated Number of Complications of Pregnancy or Delivery, by type of Delivery: United States, 1980–85 Average (Includes only deliveries in non-federal short-stay hospitals)

Number of Complications of Pregnancy or Delivery	Total	Type of delivery			
		VBAC	Other Vaginal	Repeat Cesarean	Primary Cesarean
	%	%	%	%	%
Total	100.0	100.0	100.0	100.0	100.0
No complications	48.4	48.7	54.4	72.0	—
1 complication	35.1	31.3	34.1	19.6	49.0
2 complications	10.5	13.0	7.8	5.8	29.6
3 or more complications	5.9	7.1*	3.7	2.6	21.4

— Quantity zero.

*Figure does not meet standards of reliability or precision because the weighted numerator is less than 10,000 deliveries.

NOTE: VBAC and repeat cesarean deliveries refer only to mothers with a uterine scar from previous surgery. However, uterine scar from previous surgery was not included as a complication in this table to allow for a better comparison of frequency of the complications for the four types of delivery examined.

deliveries, not significantly higher than for other vaginal deliveries (3.0 days), but significantly lower than the 5.6 days observed for repeat cesareans and the 6.0 days for primary cesareans (Table 3). Nearly half (44.3 per cent) of the mothers with a repeat cesarean section stayed in the hospital for 6 days or more, but only 8.0 per cent of mothers with a VBAC stayed this long.

About half (48.4 per cent) of all women who delivered in the 1980–85 period had no complications of pregnancy or delivery recorded on their medical record (Table 4). About one-third of the mothers (35.1 per cent) had one complication, one-tenth (10.5 per cent) had two complications, and about one in 20 (5.9 per cent) had three or more complications. Uterine scar from previous delivery is excluded as a pregnancy or delivery complication because it is used to classify women by type of delivery. The delivery category with fewest complications is repeat cesarean—72.0 per cent had no complications. About half of both groups of women with vaginal births (VBAC and other vaginal deliveries) had no complications indicated on their medical records.

Discussion

There was very little variation in VBAC rates in the 1980–85 period according to maternal and hospital characteristics. This is an indication that the decision for a VBAC delivery is more influenced by traditional medical practice

than on an evaluation of the mother's current medical situation. Because 72 per cent of the 1.4 million women with repeat cesareans had no complications noted on their medical record (other than uterine scar from previous surgery), one might hypothesize that over 1 million women in the 1980–85 period were eligible for trial of labor. One might further assume on the basis of past medical studies that about half of these trials of labor (500,000) could have resulted in a vaginal delivery.

Given that international comparisons and US clinical experience show that half of women allowed a trial of labor could deliver vaginally, why are VBAC's so low in this country? Other countries may not have the legal climate of the US, and may follow different obstetrical guidelines. It is apparent that cesarean guidelines differ across countries because of the wide variation in rates.¹³ Many US hospitals and physicians may feel that they cannot meet ACOG's "Facilities and Personnel" guidelines, which include 24-hour blood banking, continuous EFM (electronic fetal monitoring), patient blood screening, immediate presence (throughout the entire labor) of a physician capable of performing a C-section, on-site anesthesia coverage, and the ability to move from decision to incision within 30 minutes.²⁵ Another reason is patient reluctance to consider VBAC. Patients may fear the risk of uterine rupture, may wish to schedule their deliveries to accommodate child care or employment, may be reluctant to attempt trial of labor without a labor coach for emotional support, and may view the pain of labor as more severe than the pain of surgery.²⁶

VBAC delivery involves an average length of stay of only 3.2 days, significantly less than the 5.6 days for a repeat cesarean delivery. Thus, 2.4 days of hospital stay can be averted for each VBAC delivery. If the previously stated assumptions are valid, then about 1.2 million days of hospital stay could have been averted over the 1980–85 period.

There are now numerous references in the obstetrical literature concerning the safety of VBAC, and consumer movements, books, and films have been developed which promulgate ways to avoid cesareans.^{27–31} Public concern, combined with an increased awareness by physicians, insurers, and malpractice attorneys of the relaxed guidelines for trial of labor and the safety of VBAC, are the keys to VBAC rates in the future.

REFERENCES

- Placek PJ, Taffel SM: One-sixth of 1980 births by cesarean section. *Public Health Rep* 1982; 97:183.
- National Institutes of Health: Consensus Development Conference on Cesarean Childbirth, September 1980, sponsored by the National Institute of Child Health and Human Development. NIH Pub. No. 82-2067. Bethesda, MD: NIH, 1981.
- Rosen MG: Introduction and NIH consensus development statement on cesarean childbirth. *Am J Obstet Gynecol* 1981; 139:901–909.
- Rosen MG: Introduction and NIH consensus development statement on cesarean childbirth. *Obstet Gynecol* 1981; 57:537–545.
- Placek PJ: Commentary: Cesarean rate still rising. *Stat Bull Metrop Insur Co* 1986; 67:9–10.
- Gleicher N: Cesarean section rates in the United States: The short-term failure of the National Consensus Development Conference in 1980. *JAMA* 1984; 252:3273–3276.
- American College of Obstetricians and Gynecologists: Guidelines for vaginal delivery after a cesarean childbirth. Statement of the ACOG Committee on Obstetrics: Maternal and Fetal Medicine. Washington, DC: ACOG, 1982.
- American College of Obstetricians and Gynecologists: New guidelines to reduce repeat cesareans. Statement by Dr. Luella Klein for VBAC News Conference. Washington, DC: ACOG (News Release), Jan. 25, 1985.
- Klein L: Cesarean birth and trial of labor. *Female Patient* 1984; 9:106–117.
- Taffel S, Placek PJ, Moien M: Cesarean rate increases in 1985. *Am J Public Health* 1987; 77:241–242.

11. Taffel SM, Placek PJ, Liss TL: Trends in the United States cesarean section rate and reasons for the 1980-85 rise. *Am J Public Health* 1987; 77:955-958.
12. Shiono PH, Felden JG, McNellis D, *et al*: Recent trends in cesarean birth and trial of labor rates in the United States. *JAMA* 1987; 257:494-496.
13. Notzon FC, Placek PJ, Taffel SM: Comparisons of national cesarean section rates. *N Engl J Med* 1987; 316:386-389.
14. Graham AR: Trial of labor following previous cesarean section. *Am J Obstet Gynecol* 1984; 149:35-45.
15. Gellman E, Goldstein MS, Kaplan S, Shapiro WJ: Vaginal delivery after cesarean section: Experience in private practice. *JAMA* 1983; 249:2935-2937.
16. Saldana LR, Schulman H, Reuss L: Management of pregnancy after cesarean section. *Am J Obstet Gynecol* 1979; 135:555-561.
17. Porreco RP, Meier PR: Trial of labor in patients with multiple previous cesarean sections. *J Reprod Med* 1983; 28:770-772.
18. Paul RH, Phelan JP, Yeh S: Trial of labor in the patient with a prior cesarean birth. *Am J Obstet Gynecol* 1985; 151:297-304.
19. Martin NJ Jr, Harris BA, Huddleston JF, Morrison JC, *et al*: Vaginal delivery following previous cesarean birth. *Am J Obstet Gynecol* 1983; 146:255-263.
20. Farmakides G, Duvivier R, Schulman H, *et al*: Vaginal birth after two or more previous cesarean sections. *Am J Obstet Gynecol* 1987; 156:565-566.
21. Tahirramaney MP, Boucher M, Eglinton GS, *et al*: Previous cesarean section and trial of labor: Factors related to uterine dehiscence. *J Reprod Med* 1984; 29:17-21.
22. Lavin JP, Stephens RJ, Miodovnik M, Barden TP: Vaginal delivery in patients with a prior cesarean section. *Obstet Gynecol* 1982; 59:135-148.
23. Graves EJ: Utilization of short-stay hospitals: United States 1985 Summary. *Vital and Health Statistics, Series 13, No. 91, DHHS Pub. No. (PHS) 87-1752*. Hyattsville, MD: National Center for Health Statistics, 1987.
24. Institute of Medicine: Report of a study: Reliability of National Hospital Discharge Records. Washington, DC: National Academy of Sciences, 1980.
25. American College of Obstetricians and Gynecologists, Committee on Obstetrics: Maternal and Fetal Medicine: Guidelines for vaginal delivery after a previous cesarean birth. Washington, DC: ACOG, Nov. 1984.
26. McClain CS: Why women choose trial of labor or repeat cesarean section. *J Fam Pract* 1985; 21:210-216.
27. Norwood C: How to Avoid a Cesarean Section. New York: Simon and Schuster, 1984.
28. Young D, Mahan C: Unnecessary cesareans: Ways to avoid them. Milwaukee, WI: International Childbirth Education Association Publishers, 1980.
29. Zorn EB: Cesarean Prevention Movement, P.O. Box 152. Syracuse, New York 13210.
30. Cesareans/Support Education and Concern (C-Sec Inc.): 22 Forest Road, Framingham, Massachusetts 01701.
31. Nick Kaufman Productions, 14 Clyde Street, Newtonville, MA 02160. "Once a Cesarean: Vaginal Birth After Cesarean." Video tape.

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