Spontaneous Abortion In Primary Care

A Report From ASPN

Abstract: The Ambulatory Sentinel Practice Network (ASPN) conducted an observational study of usual primary care of spontaneous abortion (SAB). Forty-nine practices in 18 states and four Canadian provinces reported and audited 171 SABs. Contrary to recommendations in some texts, 40 percent were managed completely in the office and/or at home, and only 51 percent had a dilatation and curettage (D&C). SABs occurring later in pregnancy were more likely to be managed in the emergency room/hospital, receive consultation, and have a D&C. Patients managed with D&C had a greater frequency of excessive blood loss at diagnosis, but otherwise they did not differ in terms of complications at diagnosis or follow-up from those who did not. Adverse psychological consequences were subjectively observed by ASPN clinicians in 24 percent of women, exceeding any other category of complications. Management of all SABs in a hospital with D&C, instead of the management observed in this study, could add $145,000,000 per year to health care expenditures in the United States. (JABFP 1988; 1:15-23.)

Epidemiological and clinical knowledge about spontaneous abortion (SAB) is surprisingly limited. Estimates of total prenatal mortality from fertilization to parturition vary because of inconsistent definition of when pregnancy begins and difficulties identifying early pregnancy. There is general agreement that approximately 15 percent[1,2] of clinically recognized pregnancies end in fetal death. However, 24 percent of pregnancies reaching four weeks gestation have been reported to end in loss of the conceptus,[3,4] and losses of 40 percent are estimated before and during implantation.[5]

The number of SABs coming to clinical attention in the United States is also unknown. All but eight states limit the reporting of fetal deaths to deaths that occur at 20 weeks gestation or later.[6] The 1979 and 1981 National Ambulatory Medical Care Survey (NAMCS) detected only six and 13 physician visits, respectively, with SAB as the diagnosis.[7,8] The standard error of the estimates is so large that a reliable point estimate of the number of SAB visits is not possible; however, using the NAMCS data, we conservatively estimate a range of 130,000-230,000 office visits annually for SAB. The National Hospital Discharge Survey estimated 488,000 hospitalizations in 1983 for pregnancy and abortive outcomes.[9] From Dutch studies it is possible to derive an annual estimate for SAB brought to clinical attention in the United States of about 248,000[10] based on a rate of 21 SABs per 10,000 women of all ages. For these SABs, the recommended management is clearly expressed in *Williams Obstetrics* (ed. 17),[11] which states:

> If bleeding and pain persist unabated for six hours, it is probably best to face the inevitability of abortion and either perform a dilatation and curettage . . . or . . . encourage its completion by stimulating uterine contraction with oxytocin or a prostaglandin. . . . Unless all of the fetus and placenta can be positively identified, curettage is most often indicated. p 474

However, careful appraisals of these recommendations are relatively scarce,[12-26] and emphasize infectious and hemodynamic complications. Only one study was conducted in a primary care setting.[27] The studies from the 1960s were conducted when septic abortion, usually associated with "criminal interference," was a leading cause of maternal mortality. Patients delayed seeking care, and as many as one-third were infected when they sought care. Hill[19] found clinical impressions of completed SAB to be unreliable and advocated curettage for all SABs, but at least three studies noted that not all SABs required dilatation and curettage (D&C).[13,17,18] In general, investigation has been focused on the timing and technique of curettage rather than whether or not to undertake the procedure.

From the Ambulatory Sentinel Practice Network, Denver. Address reprint requests to ASPN, Denver Place South Tower, 999 18th Street, Suite 1170, Denver, CO 80202.

Supported by grants from the W.K. Kellogg and Rockefeller Foundations.

J Am Board Fam Pract: first published as 10.3122/jabfm.1.1.15 on 1 January 1988. Downloaded from http://www.jabfm.org/ on 10 August 2022 by guest. Protected by copyright.

The Ambulatory Sentinel Practice Network (ASPN) is an affiliation of academicians and community-based, practicing clinicians in the United States and Canada, dedicated to primary care research. Given the importance of SAB as an indicator of reproductive failure and the limitations in our knowledge, ASPN undertook an observational study of spontaneous abortion in ASPN practices to investigate the following factors:

1. Frequency of SAB.
2. Major characteristics of women who spontaneously abort and receive their care from primary care clinicians.
3. Management of SAB.
4. Patient characteristics associated with management of SAB (a) in the emergency room and/or inpatient hospital setting, (b) in consultation with another specialist, (c) with D&C.
5. Complications diagnosed by ASPN clinicians when managing SAB.
6. Differences in complications experienced by patients managed with and without D&C.
7. The basis on which ASPN clinicians decide to do a D&C when managing SAB.
8. Charges associated with site of treatment and whether D&C was done.

Methods

Forty-nine practices in 18 states and four Canadian provinces collaborated in this observational study of usual care of spontaneous abortion. The ASPN procedures described elsewhere were followed.[28] Clinicians reported weekly, using a pocket-sized card designed for rapid completion. The practices were asked to report all cases of SAB seen over a 25-month period from November 1, 1982, to December 31, 1983, and March 5, 1984, to December 31, 1984, excluding a two-month reporting holiday. Reported data were organized into episodes, i.e., all data for all visits and services for an SAB were linked to an individual woman having a particular SAB. A questionnaire was completed retrospectively by two individuals in each practice to determine complications experienced at the time SAB was diagnosed, as well as in the 30 days following the diagnosis of SAB. Data are reported for women who were registered in an ASPN practice and met the following criteria for a SAB:

- Demonstration by direct inspection or by microscope that placenta or fetal tissue passed through or was retrieved from the vagina during the first 22 weeks of gestation, and/or
- Detection of pregnancy by tests (e.g., ultrasound, urine pregnancy test, serum pregnancy test) that subsequently returned to normal or were negative with or without definite documentation by the clinician of delivery of the products of conception, and
- Absence of medical or surgical intervention or evidence of self-induced intervention intended to interrupt pregnancy prior to the onset of the abortion.

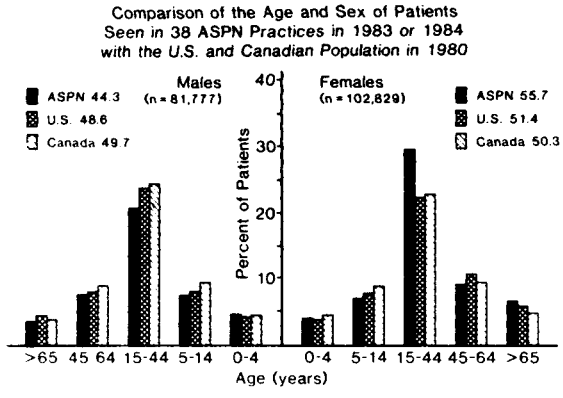

Figure 1. Comparison of the age and sex of patients seen in 38 ASPN practices in 1983 or 1984 with the U.S. and Canadian population in 1980.

There were 226 SABs reported. At least one SAB was reported by 31 practices (63 percent), and the maximum was 20 SABs for any one practice. Thirty-eight (77.5 percent) practices also reported the age-sex distribution of all patients seen at least once in the practice during 1983 or 1984. This distribution approximates the age-sex distribution of the United States and Canada. In ASPN, however, men are underrepresented, and women 15-44 years of age are overrepresented (Figure 1).

Between January 1, 1985, and August 31, 1985, two individuals in each practice audited each report from their practice, and they verified or corrected the report according to their personal knowledge of the patient and the patient's medical record. This verification of SAB episodes resulted in 35 possible SABs failing the inclusion criteria or having insufficient data. Twenty SABs were not reviewed due to practice attrition from the study. Thus, 171 SABs were available for follow-up. Figure 2 summarizes the study population. Only patients with follow-up (n = 160)

J Am Board Fam Pract: first published as 10.3122/jabfm.1.1.15 on 1 January 1988. Downloaded from http://www.jabfm.org/ on 10 August 2022 by guest. Protected by copyright.

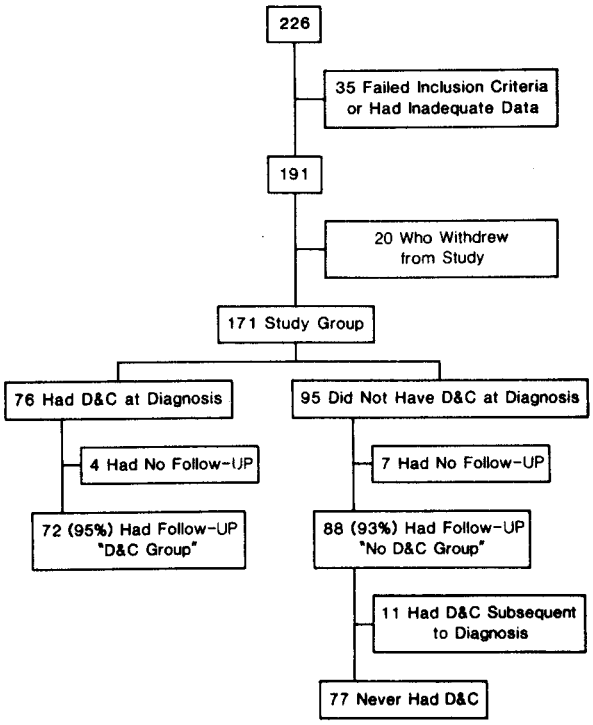

Figure 2. SAB Study population, 1983-1984.

were included in the analyses of complications, reasons for doing D&C, and charges. Because this study was conducted within the routine milieu of practice, the timing of visits to the practice following SAB varied. The recollection of clinicians and the charted notes of these subsequent visits provided information concerning the occurrence of D&C and complications during the 30 days following SAB and whether, at any time in the clinician's opinion, the patient exhibited adverse psychological consequences from the SAB.

Since a focal point of the investigation involved the decision to do a D&C, two groups were defined for comparison. First, 76 women had a D&C the day their SAB was diagnosed, and of these, 72 (95 percent) had at least one follow-up visit to the reporting practice. These 72 women were called the "D&C Group." Second, 95 women did not have a D&C the day their SAB was diagnosed, and of these, 88 (93 percent) had at least one follow-up visit to the reporting practice. These 88 women were called the "No D&C Group." Eleven women in this group eventually had a D&C but were analyzed in the "No D&C Group," since their initial management did not include D&C.

To estimate the frequency of SAB in ASPN practices, two rates were calculated. The first was based on the number of women with SABs divided by the number of women 15-44 years of age seen in the practices during 1983 or 1984 ("active patients").[29] If a practice did not have an age-sex report, its data were excluded from both numerator and denominator in this calculation. The second rate consisted of the number of SABs divided by the total encounters[29] reported by the practices during the study period. Practices with no SABs also reported weekly, and their patients and total encounters were included in this calculation. Statistical comparisons were made using chi-square and Fisher's exact test for categorical data and t-tests for continuous data. Two-tailed probabilities are quoted throughout.

The financial estimates were organized to follow the patterns of clinical care observed in ASPN and to focus on six services for which a clinical choice appeared to be available. No attempt was made to estimate costs to patients, social costs, or total costs to the medical care system for the management of SAB.

Charges were used as a proxy for resource utilization. Average charges for four selected services were calculated using the charge estimates from McGraw-Hill's *Relative Values for Physicians*. The average charges used were physician home visit, $59; physician office visit, $44; physician emergency room charge, $57; emergency room facility charge, $125.[30] An average charge of $351 was used for the fifth service, D&C.[31] For the sixth service, a hospital per diem of $520 was multiplied by an average length of stay for SAB of 1.5 days—the median values reported by three national surveys.[32-34]

To assess the appropriateness of calculating average charges, one-third of ASPN clinicians were randomly surveyed to determine their usual charges for home, office, and emergency room visits, as well as the average number of visits for SAB. The results of this survey yielded an average of $84 per SAB for these services (i.e., charges except hospital per diem and/or D&C procedure charges), which approximated the $88 calculated using the relative value scale multipliers.

The average number of visits to ASPN clinicians for SAB was 2.3. A patient-by-patient analysis was conducted to determine for each patient which six services were provided. The average charges for the services were summed for each patient. Then, four clinically distinct management strategies were defined according to whether or not the patient was ever hospitalized and ever had a D&C. All charges for the six services were

J Am Board Fam Pract: first published as 10.3122/jabfm.1.1.15 on 1 January 1988. Downloaded from http://www.jabfm.org/ on 10 August 2022 by guest. Protected by copyright.

Table 1. *Characteristics of ASPN SAB Patients, 1983–84 (n = 171).*

	Rounded Percent
Age in years	
<20	5
20–24	25
25–29	33
30–34	21
35–39	11
≥40	6
Race/ethnicity	
White	83
Black	8
Asian	1
Hispanic	4
Other	5
Type of insurance	
Private	43
Self	24
Medicaid	11
Unknown	8
Other	14
Gravidity	
1	33
2	29
3	17
4–7	22
Previous live births	
0	44
1	29
2	16
3–5	11
SABs	
1	79
2	16
3	5
At least one induced abortion	14
Pregnancy planned	
Yes	50
No	45
Unknown	5

included for each patient in each of the four management strategies. Total charges for each of the latter were divided by the number of patients in each group to derive an average charge per patient for the six services.

Because the number of SABs coming to clinical attention in the United States each year remains unknown, a conservative estimate of 230,000, based upon the NAMCS data,[8] was used to estimate national charges associated with the selected services. Two national economic estimates were made, the first assuming that the management of SABs was distributed as observed in ASPN practices, and the second assuming that all SABs were managed with D&C in the hospital. These two figures were contrasted to estimate the potential financial risk to the health care system associated with a consistent policy of D&C and hospitalization for SAB.

Results

Frequency of SAB

For women 15-44 years of age who were "active patients" in ASPN practices, the annualized frequency was 1.3 SABs per 1,000 women. There were 0.27 SABs per 1,000 encounters in ASPN practices.

Major Characteristics of Women Who Spontaneously Abort

Table 1 describes the women with SABs. These women were predominantly 20-34 years of age, white, and insured. Fewer than one-fourth had been pregnant more than three times. Over half had experienced a live birth. Only one in five had experienced a previous SAB. Only one in seven had had an induced abortion, and about half had planned their pregnancy. The distribution of SABs by gestational age is included in Table 2; over 90 percent aborted in the first clinical trimester. Distribution of SABs by gestational age was similar for ASPN and health insurance plan data.[2]

Management of SAB

Fifty-eight percent of SABs were managed at a single site: 32 percent in the office, 14 percent in the hospital, nine percent in the emergency room and three percent at home. The remaining 42 percent of SABs were managed at various combinations of two, three, or four sites. Forty percent of the SABs were managed totally outside the emergency room and hospital, and 60 percent were never hospitalized.

A D&C was part of the initial management for only 51 percent of the SABs; 43 percent of these D&Cs were done without consultation. Consultation was obtained for 31 percent of the SABs; 93 percent of these had a D&C. At diagnosis, 28 percent of the "D&C Group" and seven percent of the "No D&C Group" received oxytocic medication ($P < .001$). At follow-up, eight percent of the "D&C Group" and five percent of the "No D&C Group" received oxytocic medication. Only two

J Am Board Fam Pract: first published as 10.3122/jabfm.1.1.15 on 1 January 1988. Downloaded from http://www.jabfm.org/ on 10 August 2022 by guest. Protected by copyright.

Table 2. *Site of Management, Consultation, and D&C by Gestational Age of ASPN SAB Patients, 1983–84 (n = 171).*

Gestational Age (weeks)	SABs (number)	Management Outside Emergency Room/ Hospital (percent)	Consultation Obtained (percent)	D&C Performed (percent)
<5	15	73	27	27
5–6	25	72	16	24
7–8	35	43	20	54
9–10	41	34	29	56
11–12	27	19	51	67
13–14	17	24	41	71
15–16	6	17	33	50
17–18	1	0	100	100
19–20	1	100	100	0
21–22	3	0	33	33

percent (i.e., four) of the women received a blood transfusion, three at diagnosis and one at follow-up—all in the "D&C Group" ($P = .039$).

Patient Characteristics Associated with Management of SAB

Management in the emergency room/hospital, consultation with another specialist, and D&C were not associated with such variables as age of the patient, prior obstetrical history, and intention to be pregnant. Patients with insurance were more likely to be managed in the emergency room/hospital ($P < .05$). However, insurance status did not affect consultation or D&C. SABs occurring later in pregnancy were more likely to be managed in the emergency room/hospital ($P < .001$), receive consultation ($P < .008$), and have D&C ($P < .007$) (Table 2).

Complications

The distributions of physical complications at diagnosis and follow-up are shown in Figure 3. Complications listed as "other" included Rh incompatibility and minor events such as vasovagal reactions. Twenty-four percent of the women experiencing SAB were subjectively judged by ASPN clinicians to have adverse psychological consequences attributable to the SAB at some time following SAB.

Complication Differences between Groups

For both the "D&C" and "No D&C" groups, the most frequent complication at diagnosis was excessive bleeding; at follow-up it was endometritis. Complications decreased at follow-up for both groups except for infection in the "No D&C Group," which increased from six to eight percent. Of the women in the "No D&C Group," 81 percent had no complications at diagnosis, and 86 percent had no complications at follow-up. Of the women in the "D&C Group," 51 percent had no complications at diagnosis, and 85 percent had no complications at follow-up. Eight percent of the women in the "No D&C Group" with no complications at diagnosis had complications at follow-up, while 14 percent of the women in the "D&C Group" with no complications at diagnosis had complications at follow-up.

Table 3 shows the "D&C Group" differed significantly from the "No D&C Group" in having a greater frequency of signs and symptoms of excessive bleeding when SAB was diagnosed

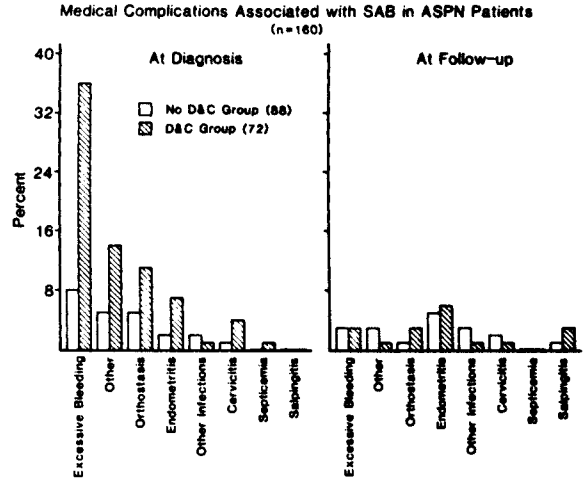

Figure 3. Medical complications associated with SAB in ASPN patients (n = 160).

J Am Board Fam Pract: first published as 10.3122/jabfm.1.1.15 on 1 January 1988. Downloaded from http://www.jabfm.org/ on 10 August 2022 by guest. Protected by copyright.

Table 3. *Comparison of Physical Complications Experienced by ASPN SAB Patients Managed Initially with and without D&C, 1983–84 (n = 160).*

Type of Complication	No D&C Group (n = 88) (percent)	D&C Group (n = 72) (percent)	*P*-Value
Infection			
At diagnosis	6	13	0.129
At follow-up	8	10	0.694
Excessive blood loss			
At diagnosis	13	38	0.001
At follow-up	5	4	0.907
Other			
At diagnosis	5	14	0.055
At follow-up	3	1	0.252

($P < .001$). When analyzed by gestational age (< 7 weeks, 7–10 weeks, > 10 weeks), this finding remained only for SAB diagnosed at 7–10 weeks of gestational age ($P < .03$). Excessive bleeding in the "D&C Group" was also more frequent in the other two gestational age categories, but the differences were not significant. At diagnosis, there was a greater frequency of "other" complications in the "D&C Group" ($P < .06$), but when broken down by gestational age, the difference was significant only for 7–10 week gestational age category ($P < .02$). At follow-up, there were no overall differences between the "D&C" and "No D&C" groups, but when broken down by gestational age, the "D&C Group" had a greater frequency of excessive bleeding in the "< 7-week" gestational age category ($P < .06$). The "D&C Group" was more likely to be hospitalized at diagnosis—60 percent versus 18 percent ($P < .001$), and the "No D&C Group" was more likely to be hospitalized at follow-up—nine percent versus zero ($P < .009$). None of the women treated initially with D&C had a second D&C; 13 percent of the "No D&C Group" had a D&C subsequently.

Clinicians' Reasons for Management

The clinicians' reasons for doing a D&C at diagnosis were usually related to their assessment of pain and bleeding (Table 4). At follow-up, excessive bleeding was the primary reason for doing a D&C.

Selected Charges

Figure 4 shows that charges for the six selected services were estimated to be $88 per SAB managed out of hospital without D&C, $497 per SAB managed out of hospital with D&C, $828 per SAB managed in hospital without D&C, and $1,248 per SAB managed in hospital with D&C. If 230,000 SABs were clinically recognized each year in the United States and all were hospitalized and had a D&C, at least $287,000,000 in charges would be generated for the six services. If their management was selectively distributed as observed in this study, the potential economic risk to the health care system would be $145,000,000 less.

Discussion

The primary care clinicians participating in this study made selective decisions about the management of patients with SAB such that approximately half of the patients with SAB were managed with D&C. Controlling for gestational age, there were no differences in complications at follow-up

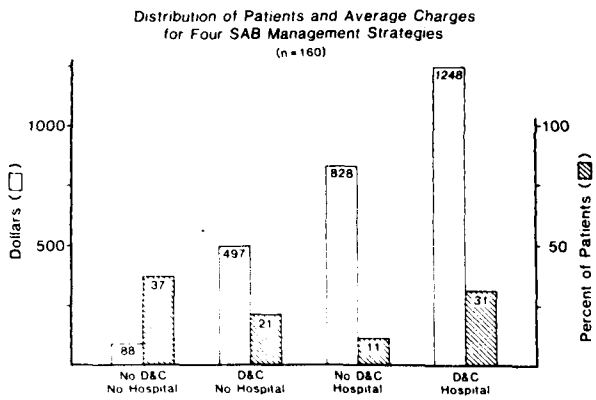

Figure 4. Distribution of patients and average charges for four SAB management strategies (n = 160).

J Am Board Fam Pract: first published as 10.3122/jabfm.1.1.15 on 1 January 1988. Downloaded from http://www.jabfm.org/ on 10 August 2022 by guest. Protected by copyright.

Table 4. *Clinicians' Reasons for Management of ASPN SAB Patients with and without D&C, 1983–84. (n = 160).*

	Number
D&C was not done at diagnosis (n = 88) because	
Pain stopped	64
Bleeding stopped	59
Patient refused	3
Local customary practice	3
Other	3
Don't know	0
D&C was done at diagnosis (n = 72) because	
Pain persisted/retained tissue	52
Bleeding was excessive	39
Local customary practice	10
Other	10
Patient requested	2
Don't know	1
D&C was done at follow-up (n = 11) because	
Bleeding was excessive	7
Pain persisted/retained tissue	2
Patient requested	2
Local customary practice	2
Other	1
Don't know	0

between the women managed with and without D&C. The ASPN clinicians usually based their decision to do a D&C on clinical assessment of the aborting woman's pain and bleeding—that is, a D&C was done if either was judged persistent or excessive; a D&C was avoided if pain and bleeding abated. Forty percent of the SABs were managed completely in the office and/or at home and would have escaped detection by a study based on emergency room or hospital patients, a fact that may explain partially why this pattern of care is not well described in contemporary textbooks. With 40 percent of SABs managed completely at home and/or in the offices of primary care clinicians and with over 40 percent of D&Cs for SAB done by primary care clinicians, training in the management of SAB should be included in primary care residency training programs.

Clinicians managing SAB are concerned about patient satisfaction with their management and also about the potential with each apparent SAB for missed diagnoses, such as ectopic pregnancy and trophoblastic disease. Additional investigation is needed to clarify the clinical approach to SAB, particularly for the subset of women initially managed without D&C but who subsequently have a D&C. If other studies confirm the infrequent occurrence of adverse/unsatisfactory consequences of managing SAB without D&C, a modification of both teaching and textbooks to reflect effective, efficient primary care practice would be in order. Based on ASPN clinicians' subjective assessment of SAB complications, it would appear that much greater attention should be directed to the study of possible adverse psychological consequences.

This is a study of usual care of SAB in a select group of primary care practices, and as such, the study has many limitations, including some of those commonly associated with other studies about SAB.[35] The study is limited to clinically recognized SAB and excludes unrecognized pregnancies that abort and for which medical care is not sought, as well as recognized SABs that are not brought to the attention of the ASPN clinician. Since some ASPN clinicians do not manage pregnant patients and patients can choose to enter the health care system at the level of the emergency room or hospital without the knowledge of their primary care physician, ASPN's experience almost certainly underestimates the number of SABs managed in the health care system. Patients and clinicians in ASPN practices may not be typical of patients and clinicians in general; however, they are likely to be more representative of patients and clinicians in primary care than are patients seen in specialty clinics and by hospital-based clinicians. As an observational study of usual care, there was no effort to randomize patients into treatment groups, and follow-up occurred at varying intervals. However, serious complications were unlikely to go unnoticed by the practices, first, because most of the patients received continuing care in the practices and, second, because a majority of the practices are in rural communities where the practice is a major source of care. Furthermore, from a clinical perspective, it is uncertain that loss to follow-up and different intervals to follow-up create a bias. If bias does occur, its direction and magnitude are unknown.

The economic estimates were not done to calculate cost of care for SAB. Rather, the intent was to estimate the magnitude of financial risk to the health care system for clinical decisions related to site of service and performance of D&C. The estimates are based only on direct costs to the health care systems for six selected services. Costs to patients and society are not considered. Estimates for charges for different patterns of care are only ap-

J Am Board Fam Pract: first published as 10.3122/jabfm.1.1.15 on 1 January 1988. Downloaded from http://www.jabfm.org/ on 10 August 2022 by guest. Protected by copyright.

proximations. However, the charge values and rates used in these estimates tend to be conservative and likely underestimate resources used for more intensive care patterns, since charges for consultation, medications, blood products, and ancillary services are excluded. Even so, it appears that if SABs were managed by avoiding D&C and hospitalization for selected patients, the annual cost of clinical services for SAB could be reduced by $145,000,000. Of course, it is possible that more timely use of a relatively expensive service might reduce subsequent expenditures and/or enhance clinical results. It is also possible that a portion of the potential savings suggested has already been realized as a result of clinicians' decisions to manage SAB in the manner identified in this study of usual care.

Conclusion

In this study, ASPN clinicians selectively departed from standard recommendations for managing SAB[11] and apparently achieved satisfactory results while limiting the use of relatively expensive services. The difference in the economic health care system between standard textbook recommendations and management observed in ASPN for six selected charges is estimated to be $145,000,000. The care of women experiencing SAB would benefit from further appraisal of different management strategies with particular attention being paid to how gestational age, pain, bleeding, and psychological suffering influence the selection and outcome of various SAB management strategies.

ASPN gratefully acknowledges Barbara Starfield, M.D., Robert C. Goodlin, M.D., and Isaac Kleinman, M.D., for their excellent suggestions during the preparation and review of the manuscript.

Spontaneous Abortion Study Authors

Larry A. Green, M.D., Principal Investigator; Lorne A. Becker, M.D.; William L. Freeman, M.D.; Erica Elliott, M.D.; Donald C. Iverson, Ph.D.; and Frank M. Reed, M.D.

Participating Practices

Canada

Alberta—Black Diamond: Foothills Family Medicine Center; British Columbia—Maple Ridge: Valley Medical Group; Ontario—Hamilton: D.W. McLean, M.D., Kitchener: Steve Nantes, M.D.; Quebec—Wakefield: Centre de Medecine Familiale de Wakefield, Ltee.

United States

Colorado—Bailey: Crow Hill Family Medical Center; Denver: Marny Eulberg, M.D., Mountain/Plains Family Practice; Englewood: Orchard Family Practice; Glenwood Springs: Mary Jo Jacobs, M.D., and Paul Salmen, M.D. Florida—Miami: Family Medicine Associates; Fort Lauderdale: James Andersen, M.D.; Hialeah: Domingo Gomez, M.D.; Ormand Beach: Roman Hendrickson, M.D. Georgia—Claxton: Hames Clinic; Warrenton: Tri-County Family Medicine Center. Massachusetts—Fitchburg: Fitchburg Family Practice Residency. Michigan—Escanaba: Upper Peninsula Medical Education Program. Minnesota—Excelsior: Milton Seifert, M.D.; Minneapolis: Nokomis Clinic, Ltd., Riverside Family Physicians; Plymouth: Group Health, Inc., Plymouth. New Hampshire—Enfield: David Beaufait, M.D., and Mark Parker, M.D.; Hillsboro: Richard Douglass, M.D.; Manchester: Manchester Family Health Center; Monroe: Monroe Clinic; New London: New London Medical Center; Woodsville: David Frechette, M.D. New York—Afton: Afton Family Health Center; Maine: Kazimieras Snieska, M.D.; Setauket: Alan Cooper, M.D. North Carolina—Bakersville: Bakersville Community Medical Clinic; Jackson: Roanoke Amaranth Community Health Group, Inc. Oregon—Reedsport: Dunes Family Health Care, Inc. Pennsylvania—Hallstead: Dennis Allen, M.D.; Honesdale: Highland Physicians, Ltd.; Yardley: Yardley Family Practice Associates. Utah—Tooele: Family Practice Group of Tooele. Vermont—Enosburg Falls: Community Health Center; Plainfield: The Health Center. Virginia—Aylett: Gus Lewis, M.D., King William Community Health Services, Inc.; Virginia Beach: Duane Lawrence, M.D.; Waynesboro: Associated Physicians, Inc. Washington—Anacortes: Family & Internal Medicine Associates, P.S.; Cle Elum: Cle Elum Family Medicine Center. West Virginia—Scarbro: New River Family Health Center. Wisconsin—Merrill: Family Medical Clinic, S.C.; Mondovi: Mondovi Family Physicians.

Board of Directors

Lorne A. Becker, M.D.; Eugene S. Farley, Jr., M.D.; William L. Freeman, M.D.; Jack Froom, M.D.; Larry A. Green, M.D.; Robert Haggerty, M.D.; Curtis Hames, Sr., M.D.; Jack Kirk, M.D.; Mark J. Magenheim, M.D.; W.W. Rosser, M.D.; Milton H. Seifert, Jr., M.D.; Kerr L. White, M.D.; and Maurice Wood, M.D.

Research Management Group

William L. Freeman, M.D.; Larry A. Green, M.D.; Mark J. Magenheim, M.D.; Eugene C. Nelson, Sc.D.; Frank M. Reed, M.D.; Professor Robin Roberts; Louis F. Rossiter, Ph.D.; Greg Stoddart, Ph.D.; and Kerr L. White, M.D.

Data Study Group

George E. Fryer, M.S.W.; Rebecca S. Miller, B.A.; Linda J. Niebauer; Frank M. Reed, M.D.

References

1. Shapiro S, Jones E, Densen P. The lifetable of pregnancy terminations in correlates of fetal loss. Milbank Mem Fund Q 1962; 40:7-45.
2. Shapiro S, Abramowicz CM. Pregnancy outcomes correlates identified through medical record based information. Am J Public Health 1969; 59:1629-50.
3. French FE, Bierman JM. Probabilities of fetal mortality. Public Health Rep 1962; 77:835-47.
4. Bierman JM, Siegel E, French FE, Simonian K. Analysis of the outcome of all pregnancies in a community. Am J Obstet Gynecol 1965; 91:37-45.
5. Hertig AT, Rock J, Adams EC. Thirty-four fertilized human ova; good, bad, and indifferent, recovered from 210 women of known fertility: study of biologic wastage in early human pregnancy. Pediatr 1959; 23:202.
6. Porter IH, Houk EB. Human embryonic and fetal death. New York: Academic Press, Inc., 1980.
7. National Center for Health Statistics. National ambulatory medical care survey, United States, 1979 summary. Vital and Health Statistics. Series 13 (Data on Health Resources Utilization), No 66.

J Am Board Fam Pract: first published as 10.3122/jabfm.1.1.15 on 1 January 1988. Downloaded from http://www.jabfm.org/ on 10 August 2022 by guest. Protected by copyright.

DHHS Pub. No. (PHS) 82-1727, Public Health Service. Washington, D.C.: U.S. Government Printing Office, 1982.
8. Department of Health and Human Services. Patterns of ambulatory care in general practice, United States, 1980-81. Vital and Health Statistics. Series 13 (Data on Health Resources Utilization), No. 73. DHHS Pub. No. (PHS) 83-1734, Public Health Service. Washington, D.C.: U.S. Government Printing Office, 1983.
9. National Center for Health Statistics; L. Lawrence. Detailed diagnoses and procedures for patients discharged from short-stay hospitals, United States, 1984. Vital and Health Statistics. Series 13 (Data on Health Resources Utilization), No. 86. DHHS Pub. No. (PHS) 86-1747. Public Health Service. Washington, D.C.: U.S. Government Printing Office, April 1986.
10. Edition of the Foundation of the Netherlands Institute for General Practice from 1-1-85 the Netherlands Institute of Primary Health Care, Ministry of Welfare, Public Health and Culture, Chief Medical Officer of Health. Continuous morbidity registration sentinel stations. Utrecht, The Netherlands, 1983:48-52.
11. Pritchard JA, ed. Williams Obstetrics. 17th ed. Norwalk, Connecticut: Appleton-Century-Crofts, 1985:472-90.
12. Goodno JA, Cushner IM, Molumphy PE. Management of infected abortion. Am J Obstet Gynecol 1963; 85:16-23.
13. Neuwirth RS, Friedman EA. Septic abortion. Am J Obstet Gynecol 1963; 85:24-34.
14. Radovr P. Curettage in everyday obstetrical practice. Am J Obstet Gynecol 1965; 93:589-90.
15. Macourt D. Incomplete abortion: an analysis of one method of management of incomplete abortion. Med J Aust 1966; 2:640-2.
16. Peretz A, Grunstein S, Brandes JM, Paldi E. Evacuation of the gravid uterus by negative pressure (suction evacuation). Am J Obstet Gynecol 1967; 98:18-22.
17. Donald I, Abdulla U. Ultrasonics in obstetrics and gynecology. Br J Radiol 1967; 40:604.
18. Ostergard DR, Bradley JG. Septic incomplete abortion: a retrospective study of twenty years experience. Obstet Gynecol 1970; 35:709-13.
19. Hill DL. Management of incomplete abortion with vacuum curettage. Minn Med 1971; 54:225-8.
20. Marshall BR. Emergency room vacuum curettage for incomplete abortion. J Reprod Med 1971; 6:61-2.
21. Keith LG, Poma-Herrera P. Aggressive treatment of septic abortion. Am Fam Physician 1971; 3:98-103.
22. Little H. Managing incomplete abortion. Am Fam Physician 1974; 9:137.
23. Filshie GM, Sanders RR, O'Brien PMS, Overton J, Khattab T, Oats JJN. Evacuation of retained products of conception in a treatment room and without general anaesthesia. Br J Obstet Gynecol 1977; 84:514-6.
24. Jeong W-G, Kim CH, Berstine RL, Crawford WL. Ultrasonic sonography in the management of incomplete abortion. J Reprod Med 1981; 26: 90-2.
25. Fortney JA. The use of hospital resources to treat incomplete abortions: examples from Latin America. Public Health Rep 1981; 96:574-9.
26. Beeby D, Hughes JOM. Oxytocic drugs and anesthesia: a controlled clinical trial of ergotamine, syntocinon, and normal saline during evacuation of the uterus after spontaneous abortion. Anaesthesia 1984; 39:764-7.
27. Kennon RW. Survey of abortion 1962-1964. The North-West England Faculty J Royal Coll Gen Practitioners 1971; 21:311-2.
28. Green LA, Wood M, Becker L, et al. The ambulatory sentinel practice network: purpose, methods, and policies. J Fam Pract 1984; 18:275-80.
29. Froom J, Westbury R, Aloysius D. An international glossary for primary care. J Fam Pract 1981; 13:671-81.
30. Relative Value Studies, Inc. Relative values for physicians. New York: McGraw-Hill, 1984.
31. Kirchner M. Who's doing the best job of holding down fees? Med Economics 1985; 62:137.
32. American Hospital Association, Hospital Statistics, 1984 Edition, Data from the American Hospital Association 1983 Annual Survey, Chicago, 1984.
33. National Center for Health Statistics, Dennison CF. 1984 summary: national hospital discharge survey advance data from vital and health statistics no. 11. DHHS Pub. No. (PHS) 85-1250. Public Health Service, Hyattsville, Maryland; September 27, 1985.
34. Committee on Professional and Hospital Activities. Length of stay by diagnosis. United States Western Region, CPHA publication, Ann Arbor, Michigan; October 1986.
35. Taylor WF. On the methodology of measuring the probability of fetal death in a prospective study. Hum Biol 1964; 36:86-103.

J Am Board Fam Pract: first published as 10.3122/jabfm.1.1.15 on 1 January 1988. Downloaded from http://www.jabfm.org/ on 10 August 2022 by guest. Protected by copyright.