

Pregnancy Outcome Following Previous Induced Abortion

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The increasing utilization of induced abortion following liberalization of abortion laws in many countries has aroused concern about the possible harmful effects. A considerable number of studies reported on immediate risks of induced abortion include trauma, infection and bleeding¹⁾. It is more difficult, however, to determine the late sequelae of induced abortions using follow-up studies. The majority of the investigations then are based on a retrospective approach. The methodology of various studies show a diverse pattern, and findings often conflict. The late sequelae of induced abortion are reported to include uterine synechae, reduced fecundity, cervical incompetence with increased spontaneous miscarriage particularly in the second trimester, premature birth, and rhesus isoimmunization.

This paper will be confined to a discussion of the outcome of pregnancies subsequent to previous induced abortion.

Risk of Subsequent Spontaneous Abortion

C.S. Wright et al. conducted a study of 3,223 patients who attended the Queen Charlotte's Hospital in England antenatally and who delivered in 1971²⁾. Of these patients, 91 who had experienced an induced abortion in preceding pregnancies were matched by age with patients who had previously experienced a spontaneous abortion. Results showed a statistically significant increase in the number

of second-trimester abortions in the first group ($X^2=4.21$, $p 0.05$). In comparing the 91 cases with previous induced abortions with all 3,223 deliveries including those with a spontaneous abortion, tenfold increase in second-trimester miscarriages among the 91 women with induced abortions was observed. However, no increase in the incidence of other obstetric abnormalities, including first-trimester miscarriages, was observed.

The researchers suggested that the increase in second trimester miscarriages indicates cervical incompetence caused by the cervix dilatation used during termination procedures.

Retrospective studies conducted among 7,000 women who attended Sussex University Hospital in England by Dr. Liu and coworkers, support the findings of Dr. Wright in noting a statistically significant increase in second-trimester miscarriages among women who experienced an induced abortion compared to those with a spontaneous abortion without a subsequent D & C procedure³⁾. ($X^2=6.2$; $p 0.01$) (See Table 1)

A retrospective mail and interview survey of 3,877 Japanese women, conducted by L. H. Roht and H. Aoyama, compared a post induced abortion group with control groups matched by age and parity⁴⁾. The results suggest that the rate of spontaneous abortion did not increase among women experiencing a previous induced abortion, which disagrees with the findings of Wright and Liu. (See Table 2)

Table 1. Subsequent Miscarriage Following Abortion

Pregnancy History	Total Number of Patients	Subsequent First-Trimester Abortions		Subsequent Second-Trimester Abortions	
		No.	%	No.	%
Spontaneous Abortion Without D & C	306	96	21.6	2	0.65
Spontaneous Abortion with D & C	229	40	17.5	1	0.09
Induced Abortion in First-Trimester	112	0	7.1	4	4.40

Source: Liu, D.T.Y. et al., Lancet, 1972, ii, 431

Table 2. Spontaneous Abortion by Maternal Age and Previous Induced Abortion Status and Type of Survey

Maternal Age	Induced Abortion Status	Spontaneous Abortion	
		Mail Survey	Interview Survey
		Rate/100 Reported Pregnancies	Rate/100 Reported Pregnancies
20	No	14.1%	7.9%
	P.A.	12.5	—
20 ~ 24	No	10.2	13.5
	P.A.	14.3	5.9
25 ~ 29	No	11.8	10.5
	P.A.	11.2	8.0
30 ~ 34	No	18.2	17.4
	P.A.	20.6	19.4
35 ~ 39	No	19.6	36.4
	P.A.	21.1	33.3
40 ~ 44	No	33.3	—
	P.A.	—	—

* P.A: Previous Abortion

Source: Roht, L., Aoyama, H., Am. J. Obstet. Gynec. 1974, 120, 868.

Subsequent Stillbirths

S.N. Pantelakis and others studied 13,242 women admitted for delivery at the State and University Alexandra Maternity Hospital in Greece from 1966 to 1968⁵⁷. The samples were divided into three social classes according to education, occupation, and standard of living with Class III the lowest. 6,575 multigravid women of social Class III were further divided into four sub-groups. The first and second

sub-groups were composed of women without and with previous induced abortion. The stillbirth rate in the second sub-group was double that of the first sub-group. (See Table 3)

Prematurity

The same investigation by Pantelakis reported the premature rate among women experiencing a previous induced abortion was double that of the control group who had not experienced an

Table 3. Frequency of Stillbirths and Premature Births among Women of Social Class III Not Experiencing and Experiencing Previous Induced Abortion

Social Class III Women	Total Deliveries	Stillbirths		Deliveries up to 36 Weeks	
		No.	%	No.	%
Sub-Group 1; Without Previous Induced Abortion	3,271	80	2.4*	261	7.9**
Sub-Group 2; With Previous Induced Abortion	1,508	64	4.2**	251	16.6**

* p 0.001

** p 0.0001

Source: Pantelakis, S.N. et al., Am. J. Obstet. Gynec. 1973.

Table 4. Proportion of Deliveries Occurring Before 33 Weeks Gestation, 34 to 36 Weeks and 37 Weeks or More by Number of Previous Induced Abortion

Number of Induced Abortions	Gestational Age					
	Less than 33 Weeks		33 to 36 Weeks		37 Weeks or More	
	No.	%	No.	%	No.	%
0	108	3.0	206	5.8	3,236	91.2
1 to 2	68	9.3	65	8.9	598	81.8
3 to 4	14	11.3	19	15.3	91	73.4
5 or more	16	25.8	14	22.6	32	51.6
Total	206	4.6	304	6.8	3,957	88.6

Source: Papaevangelou, et al., J. Obstet. Gynec. Br. Commonw. 1973, 80, 418.

Table 5. Low Birth Weight (LBW) by Pregnancy Order and Pregnancy Outcome among Yugoslavian Women

Pregnancy Order	Pregnancy Outcome	LBW Deliveries		Deliveries 2,501 Gm	
		No.	%	No.	%
1	D	38	5.29	681	94.71
2	D-D	4	1.70	231	98.30
2	A-D	4	5.63	67	94.37

* D=Delivery; A=Induced Abortion

Source: Hogue, C.J., Am. J. Obstet. Gynec. 1975, 123-7, 675.

induced abortion was double that of the control group who had not experienced an induced abortion. (See Table 3)

Based upon an investigation of 4,847 mothers at Alexandra Maternity Hospital, Greece between 1969 and 1970, G. Papaevangelou and coworkers also reported that the incidence of prematurity was more than two fold among

women with one or more induced abortions when compared to those who had not experienced induced abortions⁶⁹. (See Table 4)

Low Birth Weight

Several studies reported that low birth weights occurred more frequently among the

babies born to Hungarian women who experienced a previous induced abortion than those women who had not⁷⁻⁹).

In contrast, a prospective study of 948 women in Yugoslavia, by C.J. Hogue in 1972 reported that previous induced abortion was not an important predictor of low birth weight in subsequent infants¹⁰. (See Table 5)

Possible Maternal Factors Affecting Both Abortion Status and Subsequent Pregnancy Outcome

Women who have had an induced abortion are different in many ways from those who have not. The results of an interview survey of 4,216 randomly selected married-Korean women

Table 6. Number and Percent of Ever Married Women 20-44 with Induced Abortion (Group A) and Total Interviewed (Group B) by Demographic Characteristics; National (Weighted; Number in 1000s)

Characteristics	No. of Women in Group		% Distribution of Group		Group A as % of Group B for Specified Item
	A	B	A	B	
Total Interviewed	1,118	4,216	100	100	27
1. Wife's Current Age					
20~24	48	479	4	11	10
25~29	162	933	14	22	17
30~34	297	1,036	27	25	29
35~39	366	988	33	23	37
40~44	245	780	22	19	31
Mean			35.2	33.3	
2. Duration of Marriage					
Under 5 years	93	935	8	22	10
5~9	192	922	17	22	21
10~14	267	944	24	22	28
15~19	273	694	24	16	39
20~24	189	466	17	11	41
25 & over	104	256	9	6	41
Mean			15.1	12.0	
3. Number of Pregnancies					
4 or less	240	2,174	21	25	11
5 or more	878	2,042	79	48	43
Mean			6.7	4.6	
4. Number of Births					
4 or less	699	2,816	63	67	25
5 or more	418	1,400	37	33	30
Mean			4.0	3.6	

Source: Hong, S.B., Watson, W.B., The Increasing Utilization of Induced Abortion in Korea, University Press, 1976.

Table 7. Percent Distribution on Selected Socio-Economic Indicators of Aborted Women (Group A) and All Women (Group B) and Group A as Percent of Group B by Wife's Current Age (National; Unweighted)

Indicator	% Distribution of Group		Group A as % of Group B by Wife's Current Age					
	A	B	20~44	20~24	25~29	30~34	35~39	40~44
Total Interviewed	100	100	26	10	17	28	36	31
1. Wife's Education								
Low (Primary or less)	66	75	23	6	13	23	31	28
High (Middle or More)	34	25	35	14	25	42	58	50
2. Husband's Occupation								
White Collar	46	36	35	12	24	40	50	44
Blue Collar	41	56	20	8	12	20	29	27
Unemployed	13	7	51	22	21	50	72	58
3. Number Modern Objects in Home								
0~3	37	51	19	19	13	21	25	21
4~6	46	39	31	10	21	33	43	36
7 or more	17	10	45	11	19	48	63	57
4. Religion								
None*	58	67	23	10	14	25	32	27
Buddhist	29	21	36	18	25	35	45	39
Christian	13	12	28	3	21	31	40	35

* Included a few cases of other religions. A few Confucians are excluded. Virtually the entire Korean population is at least partly Confucian in a cultural sense.
Source; Ibid.

found that women who experienced induced abortion were more likely to be older, have a longer marital life, have more pregnancies and childbirths, and be of a higher socio-economic status than women who had not experienced induced abortion¹¹⁾. (See Table 6 and 7)

Analysis of a series of 26,000 consecutive births in Taiwan was reported by J. Daling and I. Emanuel in 1975¹²⁾. When no adjustment was made for intervening maternal variables, a significant relationship was found between previous abortion and subsequent pregnancy outcome. (See Table 8)

However, in a matched-pair cohort study controlling for age, total pregnancy order, previous fetal deaths and socio-economic status,

all such relationships disappeared. It is obvious then that these other socio-demographic variables affect the outcome of subsequent pregnancies as much as previous induced abortion experience (See Table 9)

A prospective study of 11,057 pregnancies of West Jerusalem women for the period of 1966 ~1968 by H. Harlap and M. Davies utilized multiple regression analysis to determine the effects of socio-demographic variables and previous induced abortions on the outcome of subsequent pregnancies¹³⁾.

The risk of early neonatal death was double and late neonatal death increased threefold among infants of women who experienced a previous induced abortion. Also among this group of women, major and minor malforma-

Table 8. Outcome of Subsequent Pregnancy by Previous Induced Abortion Status

Outcome	Total	Previous Induced Abortion		No Previous Induced Abortion	
		No.	Rate/1,000 Total Pregnancies	No.	Rate/1,000 Total Pregnancies
Liveborn	21,233	1,741	918.2	19,492	949.1
Stillborn	412	49	25.8	363	17.7
Early Neonatal Death	326	43	22.7	283	13.8
Miscarriage	168	29	15.3	136	6.8
Induced Abortion	15	2	1.1	13	0.6
Congenital Malformation	280	32	16.9	248	12.1
Total	22,434	1,898		20,538	

Source: Daling, J. et al., Lancet, 1975, 170.

Table 9. Outcome of Subsequent Pregnancy for 979 Matched Pairs of Women Who Did and Did not Experience a Previous Induced Abortion Controlled for Age, Total Pregnancy Order, Previous Fetal Deaths and Socio-Economic Status

Outcome	Case+/Control+	Case+/Control-	Case-/Control+	McNemar's X ²
Liveborn	801	87	74	0.89
Stillborn	1	28	43	2.76
Early Neonatal Death	2	25	23	0.02
Miscarriage	0	16	18	0.03
Induced Abortion	0	2	1	—
Congenital Malformation	0	17	16	0.00

Source; Ibid.

tions, and low birth weight rates the majority being pre-term births were higher. However, no significant differences between the two groups were found in terms of stillbirth of postnatal death rates, mean birth weight, sex ratio, isoimmunization, placenta previa, toxemia, hydramnios, fetal distress, or postpartum hemorrhage.

A prospective study supported by the World Health Organization concerning the outcome of pregnancy following an induced abortion conducted in collaboration with eight research centers located in Europe and Korea, is currently in progress. At the time of this presentation more than 30,000 women have been recruited for the study in which relevant

variables are matched and follow-up is maintained throughout the course of subsequent pregnancies. It is too early to report any findings from this study.

Summary

Considerable data has been reported on the outcome of pregnancies subsequent to induced abortion, but the findings contain a great deal of inconsistency and disagreement. Most studies strongly suggest that normal deliveries are less likely to occur in subsequent pregnancies following induced abortion, in terms of gestation length, birth weight, stillbirth, and miscarriage.

Other work suggests that some of the demo-

graphic and health characteristics of women who experience induced abortion are different from those women who do not; and these factors may affect the outcome of subsequent pregnancies profoundly rather than the induced abortion itself.

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