



The rate of ectopic pregnancy for 24,589 quinacrine sterilization (QS) users compared to users of other methods and no method in 4 provinces in Vietnam, 1994–1996

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Abstract

Objective: To determine the rates of ectopic pregnancy with the use of quinacrine sterilization (QS) compared to other methods and no method (non-users). **Methods:** Four provinces were selected for their above average numbers of women who had undergone QS: Nam Dinh, Nam Ha, Hai Duong and Hung Yen. Case histories related to surgical treatment of all ectopic pregnancies in these 4 provinces from 1994 through 1996 were collected from all hospitals by researchers from the Ministry of Health in June 1997. Using a questionnaire designed for this study, 120 physicians interviewed every woman in her home who had had an ectopic pregnancy during this period. If deceased, a family member was consulted. All interviews were completed in September 1998. The numbers of users of each method and nonusers were calculated from service statistics and demographic data. **Results:** Based on 2,551,355 woman-years of exposure, the rate of ectopic pregnancy among users per 1000 woman-years was calculated to be: 0.26 with QS; 0.42 with surgical sterilization (TL) and IUD; 0.45 with the Pill; 0.50 with condoms; 0.78 relying on withdrawal; and 1.18 among non-users. **Conclusion:** Ectopic pregnancy rates for QS, TL, IUD and the Pill were similar and much lower than the rate for non-users of contraception.

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1. Introduction

Ectopic pregnancy is a serious complication in Vietnam where communication and transportation in rural districts are poor. These conditions contribute to the high mortality due to ectopic pregnancy complications found there. Laparotomy remains the only method for treatment. Understandably, ectopic pregnancy is much feared in Vietnam, especially in the countryside.

In recent years, rumors about the likelihood of

ectopic pregnancy following sterilization have become widespread. These rumors have been damaging to both surgical sterilization (TL) and quinacrine sterilization (QS). The result: acceptability of TL among women plummeted in recent years. [1]

QS has not been offered in Vietnam since December 1993. The program was halted when the World Health Organization Human Reproduction Program (WHO HRP) sent a letter to Vietnam stating: “WHO experts and FDA officials have said that they would be very surprised if quinacrine did not turn out to be carcinogenic.” [2] Neither WHO HRP nor any other institution has offered any evidence to support this claim since it was made. Sokal reported in 2000 that,

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after 19 years of follow-up and 13,444 woman-years of experience with QS, patients in a Chilean study showed: “Rates of cancer among women exposed to intrauterine quinacrine are not significantly different from population-based rates.” [3] Since December 1993, a surgical procedure has been the only sterilization option in Vietnam. However, QS users continue to account for a large fraction of sterilized women in some provinces.

In a study of 31,781 QS cases in Vietnam, we examined ectopic pregnancy in a small subset of women. We found the incidence to be 0.89 per 1000 woman-years. This was higher than the rate reported in the United States after surgical sterilization (0.32 per 1000 woman-years) but lower than among American women not using contraception (2.6 per 1000 woman-years). [4]

However, to counter the rumors we decided to undertake a definitive study to determine the rates of ectopic pregnancy among users of both QS and surgical sterilization, temporary contraceptive methods, and non-users of contraception. Since QS is no longer offered, this study would necessarily be retrospective.

2. Methods

This retrospective study was initiated in June 1997. To insure that an adequate number of QS patients were included, four provinces known to have larger numbers of cases were chosen: Nam Dinh, Nam Ha, Hai Duong and Hung Yen. Researchers from the Ministry of Health obtained permission to collect and copy every single case history related to the treatment of ectopic pregnancy in all district and provincial hospitals in these 4 provinces during the 1994–1996 period. A first analysis was carried out to confirm that only women with a correct diagnosis of ectopic pregnancy would be included in this research.

Each ectopic patient identified by the researchers would be interviewed by one of 120 medical doctors. They are on the staff of one of 15 provincial and district hospitals or of one of the provincial Maternal and Child Health/Family Planning Centers, and provide family planning services in these provinces. A questionnaire was developed by the International Federation for Family Health for this study and modified by the Department of Maternal and Child Health/Family Planning of the Ministry of Health after a pretest of 20 cases.

To minimize potential biases, all interviews took place in the homes of the women who had experienced an ectopic pregnancy. Finding these homes was the most difficult phase of this study because the address recorded in the hospital record was often inadequate. In most cases, a local guide was necessary. This interviewing phase was completed in September 1998.

To calculate and analyze the rates of ectopic pregnancy, we needed to know the number of users of each of the contraceptive methods and no method in the 4 provinces under study. The number of users was determined in the following way: The 4 provinces all lie within the 7-province Red River Delta Region, near Hanoi. This region has the largest population of the 7 regions of the country. Its population is also the most knowledgeable about contraception, with the highest proportion of users of modern methods of contraception of any of the 7 regions. [5] This practice is substantially higher than for the country as a whole. For this reason, it was decided that regional contraceptive prevalence survey data would produce more accurate results than the national statistics. However, QS and TL were combined in the prevalence survey which simply asked the question “female sterilization yes/no.” As a result, we decided to use program data to determine the number of QS and TL users in these four provinces.

3. Results

Among 1,654 medical records collected from provincial and district hospitals, 1,582 were chosen for interview. Following a preliminary analysis, the other 72 records were excluded because they were not related to ectopic pregnancy. Table 1 shows the distribution of ectopic pregnancies by age group and province. They are widely distributed across the age groups, reflecting the distribution of all pregnancies by age. Nearly three-fifths occurred to women 30–39 years of age. Lower abdominal surgery resulted in a significantly increased risk of ectopic pregnancy (Table 2) in all provinces studied. About one ectopic pregnancy out of 20 occurred in a woman who had not previously given birth.

The fertility history of women prior to ectopic pregnancy was remarkably similar among the 4 provinces (Table 3). Death of a child from birth until this follow-up among these women was remarkably low

Table 1
Ectopic pregnancy by province and age group, 1994–1996, Vietnam

Province	Age group						Total	
	15–19	20–24	25–29	30–34	35–39	40–44		45–49
Hai Duong	4	33	122	206	151	97	8	621
Ha Nam	3	18	28	36	44	21	3	153
Hung Yen	2	15	43	76	64	34	3	237
Nam Dinh	6	49	105	178	163	63	7	571
Total <i>N</i>	15	115	298	496	422	215	21	1582
(%)	(0.9)	(7.3)	(18.8)	(31.4)	(26.7)	(13.6)	(1.3)	(100.0)

Table 2
History of lower abdominal surgery and pregnancy prior to ectopic pregnancy by province, 1994–1996, Vietnam

Province	Lower abdominal surgery prior to EP ^a		One or more pregnancies prior to EP	
	<i>N</i>	%	<i>N</i>	%
Hai Duong	50	8.1	594	95.7
Ha Nam	9	5.9	137	89.5
Hung Yen	21	8.9	223	84.5
Nam Dinh	39	6.8	553	96.8
Total	120	7.6	1,507	95.3

^a EP = ectopic pregnancy.

at 0.06 children per couple, or about one child lost per 17 couples. Table 4 shows that abortion does not increase the risk of ectopic pregnancy. Women using QS and TL (*N* = 13,487) who had not had an ectopic pregnancy [1] had experienced a similar mean number

of abortions as the ectopic pregnancy patients (0.92 and 1.07, respectively).

Three deaths were identified in this series (1994–1996), 2 in Nam Dinh Province and 1 in Hung Yen Province (Table 5). The cause of death for all three was the same: severe bleeding without a blood transfusion. None of the deaths were QS or TL patients. Of the 1,582 ectopic pregnancies, 24 were initially misdiagnosed and treated for another condition such as PID. Most underwent surgery immediately (91.5%) and 110 women (7.0%) were observed for a period before surgery. While the diagnosis was confirmed by laparotomy in 97.2% of the cases, a pathology exam was required in the remaining 2.8%. Nearly half of the ectopic pregnancy patients chose to have surgery on both tubes during the ectopic pregnancy operation for permanent contraception (Table 6). All women were asked about their outcomes with these procedures. The gross failure rate for surgical sterilization among

Table 3
Fertility history prior to ectopic pregnancy diagnosis, by province, 1994–1996, Vietnam

Province	Pregnancies (mean <i>N</i>)	D&Cs ^a (mean <i>N</i>)	MRs ^b (mean <i>N</i>)	Spontaneous abortions (mean <i>N</i>)	Births (mean <i>N</i>)	Living children (mean <i>N</i>)
Hai Duong	3.40	0.59	0.40	0.20	2.33	2.17
Ha Nam	3.53	0.45	0.51	0.20	2.47	2.40
Hung Yen	3.37	0.52	0.35	0.16	2.43	2.39
Nam Dinh	3.40	0.38	0.53	0.27	2.35	2.31
Total	3.42	0.48	0.44	0.20	2.37	2.31

^a D&C, induced abortions.

^b MR, menstrual regulation (early abortion).

Table 4

Mean number of abortions and menstrual regulations among ectopic pregnancy patients ($N = 1,582$) compared to women using quinacrine sterilization (QS) and tubectomy (TL) ($N = 13,487$)^a in the Red River Delta, Vietnam, in the 1990s

	Pregnancies (mean N)	Induced abortions (mean N)	MRs ^b (mean N)	Abortions (total mean N)
Ectopic patients	3.2	0.56	0.51	1.07
Non-ectopic patients (QS and TL users)	4.6	0.48	0.44	0.92

^a See reference [1] for source of these QS and TL data. Note: data on ectopic pregnancy comes from 4 provinces in the Red River Delta: Hai Duong, Ha Nam, Hung Yen and Nam Dinh. Data on non-ectopic pregnancies are from the same 4 provinces and Thai Binh.

^b MR = menstrual regulation (early abortion).

Table 5

Outcome of ectopic pregnancy by province, 1994–1996, Vietnam

Province	Treatment at admission									
	Deaths within 42 days of LMP ^a		Immediate surgery		Follow-up first		Medical treatment first		Diagnosis confirmed by laparotomy	
	N	%	N	%	N	%	N	%	N	%
Hai Duong	–	–	560	90.2	55	8.9	6	1.0	589	94.8
Ha Nam	–	–	146	95.4	5	3.3	2	1.3	150	98.0
Hung Yen	1	0.4	222	93.7	12	5.1	2	0.8	223	94.1
Nam Dinh	2	0.4	519	90.9	38	6.7	14	2.5	566	99.1
Total	3	0.2	1,447	91.5	110	7.0	24	1.5	1,537	97.2

^a LMP = last menstrual period.

Table 6

Health outcomes as measured by subsequent serious complications or pregnancy of women who had a tubectomy at the time of ectopic pregnancy surgery vs. women who did not, by province, 1994–1996, Vietnam

Province	Tubectomy, N (%)			No tubectomy, N (%)			Both	Ectopics total N (%)
	Total	Pregnancy	Complications	Total	Pregnancy	Complications		
Hai Duong	330 (53.1)	6 (1.8)	9 (2.7)	291 (46.9)	71 (24.4)	49 (16.8)	7 (2.4)	621 (100.0)
Ha Nam	48 (31.4)	–	1 (2.1)	105 (68.6)	12 (11.4)	20 (19.0)	–	153 (100.0)
Hung Yen	120 (50.6)	4 (3.3)	4 (3.3)	117 (49.4)	21 (17.9)	16 (13.7)	5 (4.3)	237 (100.0)
Nam Dinh	275 (48.2)	8 (2.9)	3 (1.1)	296 (51.8)	80 (14.0)	62 (10.9)	4 (0.7)	571 (100.0)
Total	773 (48.9)	20 (2.6)	17 (2.2)	809 (51.1)	184 (22.7)	147 (18.2)	16 (2.0)	1,586

^a TL, tubal ligation.

^b EP, ectopic pregnancy.

these women was 2.6% by the time of the interview. Among those who elected not to be sterilized, 22.7% had become pregnant by the time of the interview. However, patients who had not wished to be sterilized had experienced a much higher rate of serious complications subsequent to their ectopic pregnancy operation (20.2%) than those who were sterilized (2.2%).

Women who had an ectopic pregnancy following TL (Table 7) or QS (Table 8) were carefully studied to determine the distribution of the ectopics over time. Most ectopics, like most uterine pregnancies, tend to occur earlier rather than later, with the majority occurring within the first 3 years. However, in this study 2 cases are reported among TL users even after

Table 7

Time interval between sterilization and ectopic pregnancy (EP) diagnosis for tubectomy (TL) users in 4 provinces, 1994–1996, Vietnam ($N = 27$)

Patient (initials)	Sterilization date	EP diagnosis date	Time interval (months)
1. TTD	05/13/96	05/21/96	same month
2. VTT	07/01/94	03/14/95	8
3. TTT	09/01/93	06/10/94	9
4. BTK	08/19/95	05/03/96	9
5. TTL	01/01/94	01/27/95	12
6. DTT	08/23/94	08/11/95	12
7. NTD	03/13/95	05/18/96	14
8. PTL	03/01/95	06/25/96	15
9. PTH	08/01/93	01/04/95	17
10. NTT	07/01/93	12/13/94	17
11. NTH	03/30/94	09/08/95	18
12. TTH	10/01/94	08/21/96	22
13. VTG	08/01/93	07/19/95	23
14. NTL	04/01/94	03/11/96	23
15. BTL	04/29/94	05/15/96	25
16. PTL	05/06/94	08/14/96	27
17. DTG	05/10/93	12/30/95	31
18. PTL	04/01/93	12/24/95	32
19. KTT	09/23/93	06/21/96	33
20. HTT	09/10/93	06/10/96	33
21. LTQ	01/01/91	01/21/94	36
22. TTN	04/12/92	06/22/95	38
23. P TN	01/01/93	05/03/96	40
24. NTO	01/01/89	08/27/95	79
25. VTL	01/01/87	10/18/94	100
26. HTO	01/01/87	08/18/95	103
27. NTO	07/01/86	06/17/96	119
Mean months			33.1

8 years and one after 10 years and 4 cases are reported after 5 years among QS users. The mean number of months from the time of the sterilization procedure until ectopic pregnancy was 38.5 for QS and 33.1 for TL.

Table 9 shows the contraceptive method in use at the time of the ectopic pregnancy or non-use. There is a remarkable consistency across the 4 provinces. With a few minor exceptions, the ranking of each province for each method is consistent with the total number of ectopics in that province.

Table 8

Quinacrine sterilization users ($N = 17$): time interval between the second insertion of quinacrine and ectopic pregnancy (EP) diagnosis

Patient (initials)	Sterilization date	EP diagnosis date	Time interval (months)
1. NTH	03/15/94	01/21/95	10
2. NTX	07/25/93	07/21/94	12
3. LTH	07/01/93	12/05/94	17
4. LTH	05/02/92	05/09/94	24
5. VTN	12/28/93	12/13/95	24
6. BTV	05/26/90	06/16/92	25
7. DTL	02/04/94	04/05/96	26
8. TTG	08/18/92	04/11/95	32
9. HTH	11/15/92	11/03/95	36
10. LTT	05/20/92	05/03/95	36
11. VTT	09/15/93	09/05/96	36
12. VTT	01/03/93	02/25/96	37
13. HTL	04/07/91	10/29/94	42
14. DTN	08/30/91	03/11/96	55
15. NTN	04/10/90	04/23/95	60
16. NTT	02/09/90	03/03/95	61
17. VTX	03/03/91	06/02/96	63
18. TTN	01/01/90	08/01/95	67
19. DTQ	03/10/92	11/09/97	68
Mean months			38.5

The number of QS and TL procedures performed in each province over time is given in Table 10. All surgical sterilizations are tubectomies performed by minilaparotomy. No laparoscopic procedures were performed in these provinces at that time. A downward trend in the number of tubectomies is evident in all provinces. Since all QS procedures had been carried out prior to the study period, each of the 24,589 QS patients was exposed to the risk of ectopic pregnancy (as a QS user) for the full 3 years (1994–1996). However, only the TL patients who had been operated on before January 1, 1994 were exposed to this risk for the full three years. On average, women who had surgery in 1996 were exposed to 0.5 years of risk, while in 1995, an average of 1.5 years of risk and in 1994, an average of 2.5 years of risk. For this analysis we must, of course, make an assumption that an equal number of procedures are performed each month of that year. Knowing the number of QS and TL procedures

Table 9

Users of each contraceptive method or none at time of ectopic pregnancy, by province, 1994–1996, Vietnam ($N = 1582$)

Province	QS	Tubectomy	Vasectomy	IUD	Condom	Pill	Withdrawal	Other ^a	Non-use	Total
Hai Duong	5	10	–	250	23	8	56	5	264	621
Ha Nam	2	–	–	32	10	1	6	5	97	153
Hung Yen	4	9	–	85	19	7	43	2	68	237
Nam Dinh	8	8	1	188	37	9	89	12	219	571
Total N	19	27	1	555	89	25	194	24	648	1582
(%)	(1.2)	(1.7)	(0.1)	(35.1)	(5.6)	(1.6)	(12.3)	(1.5)	(40.9)	(100.0)

^a Includes periodic abstinence.Table 10
Quinacrine sterilization (QS) and tubectomy (TL) by province, 1994–1996, Vietnam

Province	Year	QS	TL
Hai Duong	Until 1994	10,227	3,541
	1994	0	3,322
	1995	0	2,769
	1996	0	2,692
	Total	10,227	12,324
Ha Nam	Until 1994	3,296	1,384
	1994	0	1,278
	1995	0	1,065
	1996	0	882
	Total	3,296	4,609
Hung Yen	Until 1994	3,221	1,779
	1994	0	1,660
	1995	0	1,384
	1996	0	1,345
	Total	3,221	6,168
Nam Dinh	Until 1994	7,845	2,771
	1994	0	2,558
	1995	0	2,132
	1996	0	1,764
	Total	7,845	9,225
Total		24,589	32,326

performed each year as shown in Table 10 allows the calculation of the number of years of exposure to the risk of ectopic pregnancy. The number of woman-years of exposure for QS patients (24,589) times 3 years equals 73,767 woman-years. The number of woman-

years of exposure for TL patients was determined by multiplying the number of women exposed by the length of exposure and adding the products. The total amounts to 64,836 woman-years.

These numbers of years of exposure, 73,767 for QS and 64,836 for TL, are used in Table 11 to calculate the rate of ectopic pregnancies. Since there were 19 ectopics during the 1994–1996 period of study and 73,767 woman-years of exposure, the QS rate per 1000 woman-years is 0.26. The formula for calculating the rate of ectopics per 1000 woman-years is a division of their number by the number of years of exposure times 1000. Similarly, the rate for TL is 0.42. For the remaining methods shown in Table 11, as well as no method or “none,” survey data for the Red River Delta was used to determine the prevalence of use of each method and no method. There are an estimated 844,800 married women in the 4 provinces under study. The number of users is calculated by multiplying the prevalence by the number of married women. The number of woman-years of exposure is determined by multiplying the number of users by 3 years since women were exposed from 1994–1996. This, of course, assumes that the contraceptive mix is static for the 3-year period. The same formula is then applied to calculate the rate of ectopics for each method and no method.

The rate for vasectomy was based on a single ectopic pregnancy and 15,206 years of exposure and may not be reliable. The rates found for the remaining methods and no method were as follows: IUD 0.42/1000 woman-years, Pill 0.45, condom 0.50, withdrawal 0.80, and no method 1.53.

The 1,582 ectopic pregnancy patients were asked

Table 11

Rate of ectopic pregnancy for quinacrine sterilization (QS), tubectomy (TL), other contraceptive methods and no method in 4 provinces in the Red River Delta, Vietnam, 1994–1996

Contraceptive method	Prevalence of method (proportion)	Users ^a (N)	Woman-years exposure (N users × 3 years)	Ectopics (N)	Ectopics (rate per 1000 woman-years)
QS	} 0.050 ^b	24,589	73,767	19	0.26
TL		32,326	64,836	27	0.42
Vasectomy	0.006	5,069	15,206	1	0.07
IUD	0.516	435,917	1,307,751	555	0.42
Pill	0.022	18,586	55,758	25	0.45
Condom	0.070	59,136	177,408	89	0.50
Withdrawal	0.096	81,101	243,303	194	0.80
Others	0.075	63,368	190,080	24	0.13
None	0.167	141,082	423,246	648	1.53
Total	1.000		2,551,355	1582	

^a Number of users based on an estimate of 844,800 married women in these 4 provinces from the Department of Maternal and Child Health/Family Planning, Government of Vietnam, Hanoi 1995.

^b Survey data do not distinguish between QS and TL female sterilization. The questionnaire reads “Female Sterilization Yes/No.” Service program data were used instead. Estimated number of female sterilizations using prevalence survey data was 42,240 ($0.05 \times 844,800$) vs. 56,915 at the end of 1996, using service program data (6,683 cases were performed in 1996).

Table 12

Opinions of 1,582 ectopic pregnancy patients on currently available contraceptives in 4 provinces during study period June 1997 – September 1998^a, Vietnam

Opinion	Method					
	IUDs (%)	Surgical sterilization (%)	Pills (%)	Injectables (%)	Condoms (%)	Traditional (%)
Very good	30.7	73.9	22.7	30.4	35.9	19.6
Good	38.3	6.2	30.7	53.5	25.8	28.8
Acceptable	31.0	19.9	46.6	16.1	38.3	51.6

^a Quinacrine sterilization was not available during this period.

during the interview what their opinion was of the currently available contraceptive methods in the 4 provinces. QS was not available during the June 1998–September 1998 period. As shown in Table 12, surgical sterilization was overwhelmingly the method of choice. When this question was asked, 97.1% of the respondents had not yet sought sterilization.

4. Discussion

There was a substantial difference in the ectopic pregnancy rate for QS (0.26) and for TL (0.42). It is possible that this difference is an artifact. The incidence

of ectopic pregnancy is not constant over time after either QS or TL. More occur in the first few years following these procedures. Over time they occur less and less until menopause. This shortcoming could not be overcome. Our QS program was initiated in 1989 and halted in December 1993. On average, QS patients had already been exposed to the risk of ectopic pregnancy for 2 years before this study was initiated, which is 2 years of the highest risk for ectopics. The ectopics that occurred during 1989–1993 do not appear in this study. To have included them would have more than tripled the investment needed to conduct this study. On the other hand, 70.7% (calculated from

Table 10) of the TL patients had less than 3 years of exposure to ectopic pregnancy following their sterilization, again the period when the risk is highest.

This same artifact accounts for some of the differences in the ectopic pregnancy rate we reported in 1993 [4] of 0.89 ectopics/1000 woman-years in Nam Ha Province now subdivided into two of the provinces reported on here, Ha Nam and Nam Dinh. All of these procedures had been performed over the previous 3 years, when, as is already noted, the risk of ectopic pregnancy is the highest. As the years since the procedure increase then the risk per year concurrently falls, as does the overall risk per 1000 woman-years. Had we followed this same group of women from our earlier report, the long-term risk would probably have also approached 0.26/1000 woman-years.

There is a second factor contributing to the rate of ectopic pregnancy following sterilization. The higher the overall failure rate, the greater the risk of ectopic pregnancy. We believe the rate of failure with QS was higher than the rate seen in this TL series. Unfortunately, it is not possible to accurately determine the QS failure rate for reasons described in a companion paper [1]. We will not be able to determine the magnitude of the effect of this second factor on the ectopic failure rate for QS. In any case, the QS ectopic rate is comparable to TL and far lower than the rate seen with non-use of contraception (1.53/1000 woman-years).

Also, the mean number of months from the time of the sterilization procedure until ectopic pregnancy was different for QS (38.5 months) compared to TL (31.1 months) as seen in Tables 7 and 8. The same artifact described above accounts for this difference. These two findings provide further evidence to support this conclusion that time of the procedure versus the period of the follow-up accounts for the difference in rates reported in Table 11 for QS and TL.

The temporary methods fared well compared to the sterilization methods. In particular, it was important to establish that the IUD was comparable (0.42) to sterilization and far lower than no use of contraception (1.53) because IUDs currently dominate our family planning program, accounting for 51.6% of all married women in Vietnam and 78% of all users of modern methods of contraception. Condoms and withdrawal are the least effective (0.50 and 0.80, respectively), failing more often than the other temporary methods reported on here. Nevertheless, both condoms and

withdrawal substantially reduce the risk of ectopic pregnancy compared to non-use of contraception.

Only 3 ectopic pregnancy deaths are reported in this series. All 3 occurred at the district level. We believe the actual number to be far greater. All too often, death occurs before a woman arrives at a hospital, either in the woman's home, on the road or in her local clinic. Death from ectopic pregnancy in Vietnam is a function of how well the communication and transportation systems are developed. The majority of ectopic pregnancy patients come to health facilities only when the clinical symptoms are very clear. Very few cases are diagnosed early using sonography, laboratory tests and/or laparoscopy because of their unavailability. Drug therapy or conservative surgery were never used for treatment. Removal of the pregnant tube is performed at both the provincial and district levels. Of the 1,581 ectopic pregnancy patients, 24 were treated with medicine alone because they had been misdiagnosed as infections around the uterus, such as pelvic inflammatory disease or colitis. The low rate of death once women arrive at the hospital is encouraging.

The risk of ectopic pregnancy following QS and TL does not completely disappear until menopause. Women seeking sterilization should be made thoroughly aware of this at counseling. Symptoms should be stressed as a part of the counseling process. All clinic staff must be similarly informed.

Currently, there are rumors circulating in Vietnam that the use of IUDs and induced abortion are the main causes of ectopic pregnancy. Abortion does not increase the risk of ectopic pregnancy. It is clear from Table 11 that IUDs do not increase the risk of ectopic pregnancy. Quite to the contrary, IUDs reduce the risk of ectopic pregnancy by nearly three-fourths, compared to non-users of contraception, who face the greatest risk of ectopic pregnancy. This study shows that, in the long run, sterilization, either QS or TL reduces the risk of ectopic pregnancy most of all.

The very favorable attitude toward sterilization found in this study (Table 12), shows a clear preference for sterilization, among women who had had an ectopic pregnancy. This leaves little doubt that a large proportion of women in Vietnam would accept QS if this method is offered again. This finding is consistent with a retrospective study conducted by Family Health International in 1994 reporting that 86% of QS users felt QS

to be a good choice of contraception for them. Furthermore, 88% had already recommended the method to someone else [6]. The low infant and early child mortality found in this study give couples confidence that their children will survive, making sterilization a most acceptable and more attractive option. Our program has been plagued by rumors, often from the international press, that QS, TL, IUDs and abortions cause ectopic pregnancy. This study, which included 2,551,355 woman-years of exposure to the risk of ectopic pregnancy (Table 11), should lay those rumors to rest.

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