



Quinacrine sterilization (QS) in Costa Rica: 694 cases

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Abstract

Objectives: To evaluate the safety, efficacy and acceptability of quinacrine sterilization (QS) in Costa Rica. **Methods:** From 1989 through August 1993, 694 women volunteered for QS in my private practice. All were referred by a family planning clinic or a local hospital obstetric service. The protocol used involved the transcervical insertion of 216 mg of quinacrine hydrochloride in the form of 6 pellets. A second dose was given 4 weeks later. All insertions were done in the first 14 days of the menstrual cycle. The procedure was similar to the CuT IUD placement. Temporary contraception was recommended for 3 months after the last insertion. The cut-off date for this analysis was April 1994. **Results:** With 7 months to 5 years of follow-up, the gross pregnancy rate was 2.5%. Side effects were relatively minor, none requiring hospitalization. **Conclusion:** QS was found to be safe, effective and acceptable.

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1. Introduction

This method has been in development since 1977, when Zipper and his colleagues began to experiment using quinacrine for nonsurgical female sterilization [1]. Since then, the procedure has been widely studied by other investigators [2–4]. The system involves the transcervical intrauterine placement of approximately 250 mg of quinacrine hydrochloride through a modified IUD inserter. Quinacrine introduced into the uterus has a sclerosing effect that normally causes occlusion of the opening of the fallopian tubes, through inflammation and fibrosis [5]. This use of quinacrine was introduced in Costa Rica in 1989, and interest in the method has grown from that time. It has been used and investigated as an alternative to a surgical procedure.

Costa Rica is a small country in Central America with a population of 3,099,063 inhabitants in 1992. Of them, 1,532,400 were females, whose life expectancy

was 74.7 years [6]. According to a National Survey of Reproductive Health, the specific fertility rate/1000 (SFR), by age and the differentiation between rural and urban women in 1990 is shown in Table 1. This rate is higher in rural than in urban areas [7]. Table 2

Table 1
Births by age, specific fertility rate and total births by geographic area, Costa Rica National Survey of Reproductive Health, 1992

Age (years)	Rural	Urban	Total
15–19	113	69	87
20–24	193	168	179
25–29	180	149	159
30–34	121	94	105
35–39	79	65	71
40–44	43	23	31
Specific fertility rate	3.64	2.84	3.16
Total births (%)	43	57	100

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Table 2
Ideal number of wanted children, Costa Rica National Survey of Reproductive Health, 1992

Age (yr)	Current number of children (mean)				Wanted (mean)
	0	1–2	3–4	5 or more	
15–24	2.7	2.6	3.6	–	2.7
25–34	2.6	2.7	3.6	4.5	3.1
35 or older	2.9	2.8	3.7	4.7	3.6
Mean	2.7	2.7	3.7	4.7	3.1

Table 3
Surgical sterilization by age in urban and rural areas, Costa Rica National Survey of Reproductive Health, 1992

Age (yr)	Cumulative percentage (%)		
	Urban	Rural	Total
15–19	–	–	–
20–24	0.6	3.9	2.2
25–29	8.0	7.4	7.8
30–34	21.4	16.7	19.4
35–39	38.5	29.3	33.8
40–44	47.9	32.0	40.4
45 or older	55.8	3.9	45.3
All	24.0	17.0	20.7

reveals the number of wanted children compared to actual live births according to the age of the woman, with a mean of 3.1 wanted children. These figures are declining among the younger women with an increasing potential demand of family planning and sterilization services [3]. Twenty-four percent of urban women compared to 17% in rural areas used the surgical sterilization method for family planning. This preference is clearly shown in Table 3 [3].

The potential demand for surgical female sterilization in women over 34 is estimated to be around 200,000. The actual cost of each of these procedures in our Social Security System is between \$500 and \$800. The total amount, to satisfy this demand, would be between 100 and 160 million US dollars.

2. Materials and methods

Between 1989 through August 1993, 694 women

electd to have QS in my private practice. All of them were referred by a family planning clinic or the local hospital obstetric service. The procedure and the possibility of failure was explained in detail to each patient. All 694 women wrote and signed an acceptance and discharge of responsibility agreement. All of them had a gynecologic examination.

The protocol used involved the transcervical insertion of 216 mg of quinacrine hydrochloride in the form of 6 pellets (International Federation for Family Health). A second dose was given 4 weeks later. All insertions were done in the first 14 days of the menstrual cycle. Lactation or use of DMPA were not contraindications. The procedure was carried out in the same way as the CuT IUD insertion, pulling the sheath back rather than pushing the pellets in, leaving a column of pellets along the midline of the uterus. If there was significant bleeding at the end of either the first or second insertion, then a third insertion was done four weeks later. Temporary contraception was recommended for 3 months after the last insertion. In order to check patients for tubal obstruction, hysterosalpingograms (HSG) were performed. Only when both tubes were obstructed in the cornual area were HSG reported as positive. The cut-off date for this analysis was April 1994.

3. Results

A total of 694 women accepted the procedure. An increase in demand for QS began after 2 years of offering this method as shown in Table 4, and this is evidence that it is acceptable and popular. The mean age of women who accepted the method is 33.4 years

Table 4
Quinacrine sterilization acceptance by year 1989–1993, Costa Rica ($N=694$)

Year	Number	Percentage (%)
1989	47	6.8
1990	32	4.6
1991	91	13.1
1992	294	42.4
1993	230 ^a	33.1
Total	694	100.0

^a Until August.

Table 5
Quinacrine sterilization (QS) by age, 1989–1993, Costa Rica
(*N* = 694)

Age	Number	Percentage (%)
16–19	2	0.3
20–24	49	7.0
25–29	135	19.4
30–34	191	27.5
35–39	211	30.4
40–44	101	14.5
45 or older	5	0.7
Total	694	100.0

Table 6
Parity of quinacrine sterilization (QS) acceptors, 1989–1993,
Costa Rica (*N* = 694)

Parity	QS acceptors (<i>N</i>)	Percentage (%)
1	22	3.2
2	174	25.1
3	239	34.4
4	131	18.9
5	61	8.8
6	37	5.3
7	13	1.9
8	7	1.0
9	4	0.6
10	6	0.9
Total	694	100.0

(Table 5). The percentage of women between 25 and 39 years of age is 77.3%. The mean number of live births is 3.4. Table 6 shows that 78.4% of the women had between 2 and 4 live births and 18.5% had 5 or more live births. Of the 694 patients, 510 (73.5%) never had an abortion.

A total of 653 women completed 2 insertions of pellets. The 41 women who had only a single dose were excluded from the remainder of the analysis. Three women received a third dose of quinacrine because they had significant bleeding after one of the two insertions. A total of 116 were lactating during the insertions.

In April 1994, the gross cumulative pregnancy

Table 7
Quinacrine sterilization failure rate by year, 1989–1993,
Costa Rica (*N* = 653)

Year	Number	Pregnancies	Percentage (%)
1989	41	2	4.9
1990	25	1	4.0
1991	88	4	4.5
1992	269	7	2.6
1993	230	2	0.9
Total	653	16	2.5

rate was 2.5% for the 653 patients who completed the treatment of two or three insertions (Table 7). There was a total of 16 pregnancies. Two ended in miscarriage, and one woman was pregnant at the time of the analysis. Five patients were lost to follow-up after they became pregnant and the outcome of their pregnancies is unknown. Eight known pregnancies finished in spontaneous birth at term with healthy children, except one, who had an esophageal atresia. All 8 of these women elected postpartum surgical sterilization. No ectopic pregnancy is reported in this series.

The post-insertion symptoms are shown in Table 8. Lower abdominal pain was the major complaint in the 24 hours after the application, of which 83 were reported as minor, 46 as mild and 6 as severe pain for which oral medication such as acetaminophen or ibuprofen were prescribed. None of the patients had to be hospitalized. One perforation occurred and no insertion was carried out at that time. In this case, it was done the following month.

Table 8
Immediate side effects of quinacrine sterilization (QS) by severity,
1989–1993, Costa Rica (*N* = 653)

Side effect	Severity			Total
	Minor	Mild	Severe	
Lower abdominal pain	83	46	6	135
Fever	16	32	0	48
Headache	6	3	1	10
Dizziness	9	1	0	10
Bleeding	48	20	3	71
Discharge	2	1	0	3

Of the 108 QS patients who were lactating, 6 (5.6%) became pregnant as opposed to the 545 non-lactating women who experienced 10 pregnancies for a failure rate of 1.8% (Table 9). This represents a relative risk of 3.1. Among the 653 women, 129 (19.8%) had hystero-grams. Bilateral obstruction was found in 115 cases (89.1%), 13 (11.3%) had unilateral obstruction, and 1 (0.8%) had no obstruction. Another family planning method was recommended to these last 14 patients. Of the 115 women who had bilateral obstruction, as shown on the hystero-gram, 5 later became pregnant, for a failure rate of 4.3% (Table 10), compared to 2.0% among those who did not have a hystero-gram, a relative risk of 2.4.

Table 9

Pregnancy rates following quinacrine sterilization (QS) of non-lactating women versus lactating women, 1989–1993, Costa Rica ($N = 653$)

Year	No lactation			Lactation		
	<i>N</i>	Pregnancies	%	<i>N</i>	Pregnancies	%
1989	21	0	0	20	2	10.0
1990	13	0	0	12	1	8.3
1991	66	1	1.5	22	3	13.6
1992	236	7	3.0	33	0	0
1993	209	2	1.0	21	0	0
Total	545	10	1.8	108	6	5.6

Table 10

Pregnancy rate following hystero-gram versus no hystero-gram, 1989–1993, Costa Rica

Year	No hystero-gram			Hystero-gram			Total women (<i>N</i>)	Total pregnancies	Total pregnancy rate (%)
	<i>N</i>	Pregnancies	Rate (%)	<i>N</i>	Pregnancies	Rate (%)			
1989	17	1	5.9	24	1	4.2	41	2	4.9
1990	6	0	0	19	1	5.3	25	1	4.0
1991	33	2	6.1	55	2	3.6	88	4	4.5
1992	252	6	2.4	17	1	5.9	269	7	2.6
1993	230	2	0.9	0	0	0	230	2	0.9
Total	538	11	2.0	115	5	4.3	653	16	2.5

Table 11

Temporary contraceptive use during and for 3 months after quinacrine insertion and risk of pregnancy, 1989–1993, Costa Rica ($N = 653$)

Method	Number	Pregnancies	Percentage (%)
Condom	227	7	3.1
IUD	45	1	2.0
Pill	246	5	2.0
Depo Provera	27	0	0
Rhythm	108	3	2.8
Total	653	16	2.5

In the 41 cases, there were women who were lactating and had a hystero-gram. Four pregnancies were observed in this unique group. This represents a failure rate of 9.8%. No differences were observed in pregnancy rates according to the temporary contraceptive method they were using (Table 11).

4. Discussion

In an effort to satisfy the demand for female sterilization services that exceeds the supply, researchers are investigating the use of a safe, nonsurgical method that can be performed easily and at a significantly lower cost. The quinacrine method is safe; no deaths are reported in this series. All complications were resolved at home and no major problems were detected.

In this series, the quinacrine pellet method with 2 insertions had a gross cumulative failure rate of 2.5%. When the insertion was carried out during the lactation period, the gross cumulative failure rate increased to 5.6% (Table 9). When a hystero-gram was used to demonstrate tubal obstruction, there was also an increase of the pregnancy rate to 4.3%, even though the hystero-gram showed bilateral occlusion, compared to 2.0% among women who had no hystero-gram (Table 10). When women were lactating and a hystero-gram

was done, the gross failure rate increased to 9.8%. The possibility of recanalization of tubes as a result of the hysteroqram is pointed out in order to explain the gross failure rate, which was less when this procedure was not used.

The quinacrine pellet method is safe and effective for female sterilization, with an increased failure rate for women who are lactating. Surgical sterilization cannot possibly satisfy the demand for the foreseeable future. A simpler nonsurgical sterilization method is needed, and that method is QS. In rural areas, where the fertility rate is higher and the surgical facilities more scarce, it is an excellent option. The main advantages of this method are the possibilities of raising contraceptive prevalence among women who want no more children, while providing more effective contraception than temporary methods.

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