Evaluation of Female Sterilization at Srinagarind Hospital

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A retrospective study of female sterilization at Srinagarind Hospital since 1978 until 2002 revealed 35,094 cases those were in the period of 25 years. These operations were performed by physicians, medical students and trained nurses in 21,383; 8,465 and 5,246 cases respectively. The presented cases were post-partum tubal resection, interval tubal resection and cesarean section with tabul resection in 25,706; 4,424 and 4,964 cases respectively. There were 350 cases of complication. The most common complication was tubal complications. Pregnancy post tubal resection were 74 cases or 0.21 percent.

Different operators had statistically significant compliction rates with Pearson chi square and Fisher exact test. Wound complication and pelvic pathology or operative difficulties were 2 types of statistically significant complications. Different types of operations had statistically significant complication rates. Six types of complications were tubal complication, wound complication, pregnancy, pelvic pathology or operative difficulties, bowel injury, and bladder injury.

Keywords: *Evaluation, Female sterilization, Srinagarind, Hospital*

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The family planning program is contained in the Thai National Economic and Social Development Plan since the third plan until now in the ninth plan. Continuous quality improvement for the reproductive health service is the most important key of success. Female sterilization is a highly effective permanent contraception and the most cost effective especially in younger women.

Srinagarind Hospital has operated since 1977. At the end of 2002, this university hospital, had service in female sterilization for 25 years. Owning to a teaching hospital, female sterilization is one of the basic operations for the general practitioner that has been mandated by the Thai Medical Council policy. Different service providers may have effects on the complication rate. Different types of operations which are postpartum tubal resection, interval tubal resection and cesarean section with tubal resection which have different surgical technique and incision sites are also considered for their complication rate. Systematic evaluation in female sterilization to know these problems will be helpful in administration, service improvement and teaching system for a high quality service.

Research hypothesis are 1) Different service providers, less experience will have more complications. 2) Different types of operation, interval tubal resection will have more complications than the others.

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Material and Method

A retrospective study of female sterilization at Srinagarind Hospital was done. All of the cases of female sterilization from 1978 until 2002 were studied. Analysis was done in different groups of service providers, different types of operation and different types of complications. There were 6 major complications. General characteristics of the cases of female sterilization were presented. Evaluation of the complication rate in different service providers and different types of operations with Pearson chi square test and

Fisher's exact test were done. A p-value of less than 0.05 was considered as statistically significant

Results

1. General characteristics of the cases of female sterilization

From 1978 until 2002, Srinagarind Hospital had totally 35, 094 cases of female sterilization. These cases were operated on by physicians, medical students, and trained nurses in 21,383; 8,465; and 5,246 cases respectively. There were postpartum tubal resection, interval tubal resection, and cesarean section with tubal resection in 25,706; 4,424; and 4,964 cases respectively.

Their age ranged from 14-56 years. Most of them were 25-29 years old, parity2, farmers, and lived in Khon Kaen. There were totally 350 cases of complication or 0.99 percent. These complications were classified into 6 types. The most common complication was tubal complication. Pregnancy post tubal resection procedures at Srinagarind Hospital were 74 cases or 0.21 percent.

2. The overall complication in different operators had statistical significance (Pearson Chi-square and Fisher's exact test). Only 2 of 6 types of complications were wound complication and pelvic pathology or operative difficulties had statistical significance (p = 0.000 and p = 0.016 Fisher exact = 0.011).

3. The overall complications in different types of operation of tubal resection had statistical significance. All 6 types of complication had statistical significance.

1. Number of female sterilizations

From 1978 until 2002, Srinagarind Hospital had totally 35,094 cases of female sterilization or an average of 1,404 cases per year. The peak of the service was in 1988 with 1,778 cases. The number of cases gradually declined and unusual increasing number in 1997. In 1997 Thailand had an economic crisis that might have had an impact on the need of female sterilization.

The total of 35,094 cases of female sterilization were operated on from 3 groups of service providers which were physicians, medical students, and trained nurses in 21,383; 8,465; and 5,246 cases respectively (Table 1).

The total of 35,094 cases of female sterilization were performed in 3 types of operation. There were postpartum tubal resection, interval tubal resection and cesarean section with tubal resection in 25,706; 4,424; and 4,964 cases respectively (Table 2).

2. Age (Table 3)

The youngest was 14 years old. This case had mental retardation and pregnancy from rape. She had tubal resection postabortion.

The oldest was 56 years old. This case had tubal resection done after 2 weeks of treatment for septic criminal abortion.

Most of them were 25-29 years old.

3. Parity (Table 4)

Most of them (60.38 percent) had parity 2. The indication for female sterilization in the nulliparous were mental retardation and psychiatric disorder. The grand multiparous in the presented service was parity 15.

Table 1. Number of female sterilization by different operators

Year	Physician (cases)	Medical student (cases)	Trained nurse (cases)	Total (cases)
1978	579	122	113	814
1979	361	407	481	1,249
1980	274	522	437	1,233
1981	354	477	777	1,608
1982	480	452	698	1,630
1983	473	519	566	1,558
1984	507	632	388	1,527
1985	419	733	249	1,401
1986	614	362	222	1,198
1987	646	266	222	1,134
1988	1,089	379	310	1,778
1989	939	213	188	1,340
1990	1,084	205	160	1,449
1991	988	459	154	1,601
1992	951	429	105	1,485
1993	1,000	437	90	1,527
1994	1,091	293	52	1,436
1995	1,098	311	21	1,430
1996	1,320	245	10	1,575
1997	1,463	237	0	1,700
1998	1,149	217	1	1,367
1999	1,197	187	0	1,384
2000	1,225	123	0	1,348
2001	1,094	120	0	1,214
2002	988	118	2	1,108
Total	21,383	8,465	5,246	35,094

Table 2. Number of female sterilization in different operation

Year	Postpartum TR (cases)	Interval TR (cases)	Cesarean section with TR (cases)	Total (cases)
1978	573	240	1	814
1979	866	383	0	1,249
1980	886	345	2	1,233
1981	1,065	521	22	1,608
1982	1,100	457	73	1,630
1983	1,129	335	94	1,558
1984	1,151	273	103	1,527
1985	1,103	179	119	1,401
1986	948	145	105	1,198
1987	870	134	130	1,134
1988	1,318	290	170	1,778
1989	993	166	181	1,340
1990	1,125	129	195	1,449
1991	1,219	117	265	1,601
1992	1,142	85	258	1,485
1993	1,183	87	257	1,527
1994	1,086	78	272	1,436
1995	1,068	70	292	1,430
1996	1,163	48	364	1,575
1997	1,223	68	409	1,700
1998	939	63	365	1,367
1999	932	79	373	1,384
2000	927	47	374	1,348
2001	864	48	302	1,214
2002	833	37	238	1,108
Total	25,706	4,424	4,964	35,094

4. Occupation (Table 5)

Most of them (47.33 percent) were farmers.

5. Residency area

Most of them or 76.69 percent lived in Khon Kaen province. The others in neighboring provinces.

6. Complication of female sterilization

There were 350 cases of complication. The total cases of female sterilization were 35,094 cases. Therefore, the complication rate was 9.9732 per 1,000 service cases. The most common complication was tubal complication which were 134 cases. Pregnancy after tubal resection procedure were 74 cases or 0.21 percent.

7. Comparing complication of female sterilization by different operators (Table 6)

The 3 different groups of operators were physicians, medical students, and trained nurses.

- The physician group included interns, residents and staff
- The medical student group included sixth year medical students which operated under the supervision of the physicians group.
- The trained nurse included trained nurses in the family planning unit.

Table 3. Number and percentage in different age group

Age (year)	No of cases	(percent)
< 15	3	(0.008)
15-19	306	(0.88)
20-24	6,477	(18.46)
25-29*	12,900	(36.76)
30-34	9,996	(28.48)
35-39	4,335	(12.35)
40-44	878	(2.50)
> 45	199	(0.57)
Total	35,094	(100.00)

* Range 14-56

Table 4. Number and percentage in different parity

Parity	No of cases	(percent)
0	63	(0.18)
1	431	(1.23)
2	21,189	(60.38)
3	9,087	(25.89)
4	2,189	(6.24)
5	702	(2.00)
≥ 6	619	(1.76)
Unknown	814	(2.32)
Total	35,094	(100.00)

Table 5. Number and percentage in different occupation

Occupation	No. of cases	(percent)
1. Farmer	16,610	(47.33)
2. Housewives	5,794	(16.50)
3. Government officer	5,168	(14.73)
4. Business person	3,817	(10.88)
5. Employee	3,705	(10.56)
Total	35,094	(100.00)

Table 6. Number of complication and complication rate per 1000 cases of female sterilization by different operators

Type of complication	Physician (21,383)		Medical student (8,465)		Trained nurse (5,246)		Total (35,094)		Pearson Chi-square or Fisher's exact
	No. of cases	Complication rate / 1,000	No. of cases	Complication rate / 1,000	No. of cases	Complication rate / 1,000	No. of cases	Complication rate / 1,000	
1. Tubal complication	69	3.2269	43	5.0797	22	4.1937	134	3.8183	p = 0.058
2. Wound complication	27	1.2627	43	5.0797	19	3.6218	89	2.5360	p = 0.000
3. Pregnancy	40	1.8706	23	2.7171	11	2.0968	74	2.1086	p = 0.356
4. Pelvic pathology or operative difficulties	8	0.3741	11	1.2995	5	0.9531	24	0.6839	p = 0.016 Fisher exact = 0.011
5. Bowel injury	12	0.5612	6	0.7088	2	0.3812	20	0.5699	p = 0.734 Fisher exact = 0.810
6. Bladder injury	4	0.1871	2	0.2363	3	0.5719	9	0.2565	p = 0.294 Fisher exact = 0.231
Total	160	7.4826	128	15.1211	62	11.8185	350	9.9732	p = 0.000

Table 7. Number of complication and complication rate per 1000 cases of female sterilization in different operations.

Type of complication	Postpartum tubal resection (25,706)		Interval tubal resection (4,424)		Cesarean section with tubal resection (4,964)		Total (35,094)		Pearson Chi-square or Fisher's exact
	No. of cases	Complication rate / 1,000	No. of cases	Complication rate / 1,000	No. of cases	Complication cation rate / 1,000	No. of cases	Complication rate / 1,000	
1. Tubal complication	91	3.5400	43	9.7197	0	0.0000	134	3.8183	p = 0.000
2. Wound complication	68	2.6453	21	4.7468	0	0.0000	89	2.5360	p = 0.000
3. Pregnancy	35	1.3615	32	7.2333	7	1.4102	74	2.1086	p = 0.000
4. Pelvic pathology or operative difficulties	11	0.4279	13	2.9385	0	0.0000	24	0.6839	p = 0.000
5. Bowel injury	14	0.5446	6	1.3562	0	0.0000	20	0.5699	p = 0.022 Fisher exact = 0.020
6. Bladder injury	0	0.0000	9	2.0344	0	0.0000	9	0.2565	p = 0.000
Total	219	8.5194	124	28.0289	7	1.4102	350	9.9732	p = 0.000

8. Comparing complications in different operations of female sterilization (Table 7)

The 3 different operations of female sterilization were postpartum tubal resection, interval tubal resection, and cesarean section with tubal resection.

Postpartum tubal resection means the operation of female sterilization which was done within 6 weeks postpartum or 42 days after delivery. However most of them were within 1-3 days after delivery. Surgical site may be subumbilical incision or 2 cm. below the uterine fundus.

Interval tubal resection means the operation of female sterilization which was done beyond 6 weeks postpartum or 42 days after delivery. In this study the authors included postabortion female sterilization that had a small sized uterus within the pelvic cavity and using suprapubic incision or laparoscope.

Cesarean section with tubal resection means the operation of female sterilization which has done accompanied with cesarean section.

Discussion

During these 25 years of female sterilization service at Srinagarind Hospital, the authors had observed some changes from several factors such as the number of cases which rapidly increased and then gradually decreases. The improvement of the district hospital service might be a factor of this phenomenon. The peak of female sterilization service was in 1988 that was associated with an increasing number of deliveries in this hospital. Another peak of service was in 1997 that was the year of the economic crisis in Thailand which had the great impact on the need of female sterilization. Since the year of the economic crisis, the total number of deliveries per year decreased markedly but the total number of female sterilizations per year decreased not proportionately.

There were some changes in service providers from several factors. In 1984 this university hospital had begun residency training in Obstetrics and Gynecology so the number of cases in the physician group gradually increased. The number of cases in the trained nurses gradually decreased due to some of them begin rotated to other positions.

The type of female sterilization in the present study was postpartum tubal resection in the majority. Cesarean section with tubal resection were operated on by staff, senior residents whose had more operative skills. Most of the interval tubal resection were done by minilaparotomy. In the present study the proportion of interval sterilization was less than Ramathibodi Hospital report 1969-1986 (Intaraprasert S et al[1]) In the Ramathibodi report 57.6% of female sterilization was interval tubal resection and using laparoscopic sterilization in 50.4%. In the present study only 12.6% of female sterilizations was interval tubal resection and using laparoscopic sterilization only in 0.69% of the interval tubal resection.

The age of the cases of female sterilization ranged from 14 – 56 years. The youngest had mental retardation and pregnancy from rape. She had tubal resection done postabortion. Some institutes recommended to do tubal resection after the age of 25 years old that reassured the maturity of the case and the health of her child. However in rural areas, some cases had 2-3 children before they were 25 year old and had decided to do tubal resection. In health economics, sterilization had the lowest cost compared with other contraceptive methods especially in the young who had more years of contraceptive effect.

Most of them had parity 2 and cases in these recent years had less parity than the formal years of the service at Srinagarind Hospital. The grand multiparity in the present study was parity 15. The nulliparity who had tubal resection were psychiatric cases or mental retardation.

The majority of them were farmers and live in Khon Kaen province.

The present study revealed 350 cases of complications which were classified into 6 types. The overall complication rate was 0.99 percent. Hendrix NW et al[2], reported in Obstet Gynecol Survery in 1999 in the topic of Sterilization and Its consequences that complications in laparoscopic female sterilization were 0.9-1.7 percent and double in laparotomy. Hendrix NW et al[2] reported a mortality rate of 3.6-4 per 100,000 cases and half of them were anesthetic complications. Bucklin BA et al[3] reported in Anesth Analg in 1999 that three million tubal sterilizations had occurred between 1977 and 1981. Twenty nine deaths were documented in this retrospective report. Eleven deaths were attributed to complications of general anesthesia. In the present study no mortality occurred.

Pregnancy post tubal resection were 74 cases that were 0.21 percent. Soderstrom RM[4] reported in Am J Obstet Gynecol in 1985 in the topic of Sterilization failures and their causes that resection methods failed most frequently because of spontaneous reanastomosis or fistula formation. In the present study the authors did not know the cause of failures because most of them had continued pregnancy and switching the contraceptive method. Vessey M et al[5]

reported in 1983 in the British Journal of Obstetrics and Gynecology that the failure rate during the 12 months after surgery was 0.37 per 100 woman-years and the rate during the subsequent months being 0.10 per 100 woman-years. In 1996, Peterson HB et al[6] reported in Am J Obstet Gynecol that the failure rate of tubal resection varied from 0.1-0.4 percent. However, Hendrix NW et al[2] reported long term 14 years of follow up that the failure rate was 2-25 fold above theoretical failure. Cumulative pregnancy in 10 years was 2.48 percent in electric cauterization with bipolar, 0.75 percent in electric cauterization with unipolar, 1.77 percent with silicone band, 3.65 percent with spring clip and 0.75 percent with postpartum partial salpingectomy. Hatcher RA et al[7] reported in The Essentials of Contraceptive Technology those 10 years cumulative pregnancy was 1.8 percent. The failure rate in the present study was 0.21 percent that was less than the others. The failure rate in the present study was hospital based. In fact, if the failed cases did not return to the hospital they might be under recorded, However pregnancy post tubal resection was consi-dered a severe complication and most of them returned to the hospital.

The overall complication in different operators were physicians, medical students and trained nurses had statistical significance. Wound complication and pelvic pathology or operative difficulties were 2 types of the statistically significant complications. However in some complications clinical significance may be considered based on the interpretation of the medical personnel.

The overall complications in different operations of tubal resection had statistical significants. All 6 types of complications had statistical significance. In the present study the complication rates of postpartum TR, interval TR and cesarean section with TR were 0.85, 2.8 and 0.14 percent respectively. The smallest number of complications in the cesarean section with TR might be associated with the operators who had more operative skill and good exposure from wound incision and adequate anesthesia. No bladder or bowel injury and other operative complications were reported in the cesarean section with TR. Pregnancy post cesarean section with TR was similar to postpartum TR and were 0.141 and 0.136 percent respectively. Pregnancy post interval TR was 0.723 percent which was much more than the others. Cunningham FG et al[8] reported in 21st ed. William Obstetrics was puerperal TR and interval TR had ten years cumulative probability of pregnancy in 0.75 percent and 2.01 percent respectively which were more than the present report.

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ประเมินการทำหมันหญิงในโรงพยาบาลศรีนครินทร์

ยุทธพงศ์ วีระวัฒนตระกูล, ชวนชม สกนธวัฒน์, ชูศรี คูชัยสิทธิ์, พรรณี กู้เกียรติกูล, เพียงจิตต์ ธารไพรสาณฑ์, อุดม งอกสิน, มลฤดี ประสิทธิ

ได้ทำการศึกษาย้อนหลังผู้มารับบริการทำหมันหญิงในโรงพยาบาลศรีนครินทร์ตั้งแต่เริ่มให้บริการในปี พ.ศ. 2521 จนถึงสิ้นปี พ.ศ. 2545 รวม 25 ปี พบว่ามีผู้มารับบริการรวม 35,094 ราย หากแบ่งตามประเภทของผู้ให้บริการผ่าตัดทำหมันหญิง 3 กลุ่ม คือ แพทย์ นักศึกษาแพทย์และพยาบาลห้องทำหมัน จะมีผู้รับบริการเป็น 21,383; 8,465 และ 5,246 ราย ตามลำดับ หากแบ่งตามประเภทของการทำหมันหญิง 3 ชนิดคือ ทำหมันระยะหลังคลอด (หมันเปียก) ทำหมันระยะปกติ (หมันแห้ง) และทำหมันพร้อมการผ่าตัดคลอด จะมีผู้รับบริการเป็น 25,706; 4,424 และ 4,964 ราย ตามลำดับ ในการให้บริการพบว่าผู้รับบริการทำหมันหญิงดังกล่าวมีภาวะแทรกซ้อนรวม 350 ราย ภาวะแทรกซ้อนที่พบมากที่สุดคือ ภาวะแทรกซ้อนที่หลอดมดลูก (tubal complication) สำหรับภาวะการตั้งครรภ์ (pregnancy) หลังการทำหมันหญิงพบ 74 ราย หรือร้อยละ 0.21

เมื่อวิเคราะห์ทางสถิติโดยใช้ Pearson chi square และ Fisher exact พบว่าภาวะแทรกซ้อนในภาพรวมที่พบในผู้ให้บริการที่ต่างกันมีความแตกต่างกันอย่างมีนัยสำคัญทางสถิติและเมื่อวิเคราะห์ย่อยในภาวะแทรกซ้อนแต่ละชนิดพบว่า ภาวะแทรกซ้อนที่แผลผ่าตัด (wound complication) และ พยาธิสภาพในอุ้งเชิงกรานร่วมกับการผ่าตัดยาก (pelvic pathology and operative difficulties) เป็นภาวะแทรกซ้อนที่มีความแตกต่างกันอย่างมีนัยสำคัญทางสถิติ กรณีภาวะแทรกซ้อนในภาพรวมของประเภทของการให้บริการทำหมันหญิงที่ต่างกัน มีความแตกต่างกันอย่างมีนัยสำคัญทางสถิติ และเมื่อวิเคราะห์ย่อยในภาวะแทรกซ้อนทั้ง 6 ชนิด คือ ภาวะแทรกซ้อนที่หลอดมดลูก ภาวะแทรกซ้อนที่แผลผ่าตัด การตั้งครรภ์ พยาธิสภาพในอุ้งเชิงกรานร่วมกับการผ่าตัดยาก ภยันตรายต่อลำไส้ ภยันตรายต่อกระเพาะปัสสาวะ พบว่ามีนัยสำคัญทางสถิติทุกภาวะแทรกซ้อน