

CAUSES AND CONSEQUENCES OF PREGNANCIES

Rani A. Bang*, Mahesh D. Deshmukh, Sunanda Khorgade and Margaret Farrell

Society for Education, Action and Research in Community Health (SEARCH)
PO & District- Gadchiroli
E-mail: search.gad@gmail.com



About the Author

Rani Bang is an Indian social activist, OBGYN Specialist and researcher working in the field of community health in the Gadchiroli district of Maharashtra, India. She with her husband Abhay Bang, have revolutionized healthcare for the poorest people in India and have overseen a programme that has substantially reduced infant mortality rates in one of the most poverty-stricken areas in the world. The World Health Organization (WHO) and UNICEF have endorsed their approach to treating newborn babies and the programme is currently being rolled out across India and in parts of Africa. The Bangs founded the 'Society For Education, Action and Research in Community Health' (SEARCH)– a non-profit organisation, which is involved in rural health service and research. The couple is the winner of the Maharashtra Bhushan Award. Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow has conferred honorary doctorates on Abhay and Rani Bang. SNDT Women's University, Mumbai has also awarded Honoris Causa to Rani Bang. The Lancet has honoured the couple as 'the pioneers of health care in rural India'. Abhay and Rani Bang are the first recipients of the Distinguished Alumni Award from the Department of International Health at the Johns Hopkins Bloomberg School of Public Health. They were also inducted into the Johns Hopkins Society of Scholars. The Bangs are honoured for their leadership in community-based health care that is now helping to save the lives of millions of the most vulnerable newborns and children. During their careers, the Bangs have helped foster a renaissance in community-based primary health care. In 2016, Johns Hopkins University conferred the Distinguished Alumni Award upon them

Introduction

Total number of cases (n)=742

Duration of study : July 1986 to November 2019

- Sterilization is the number one method of contraception used globally by the couples.
- At least 40 million people rely on vasectomy as a means of permanent birth control [1].
- Many studies on effectiveness of vasectomy have focused on places such as the United States or U.K.
- The rate of pregnancy after vasectomy was once thought to be extremely low, approximately one pregnancy in 1000 procedures; however upon further examination of men attending a British clinic, one in 165 men were found to have reappearance of low sperm

counts suggesting the rate of pregnancy is higher than one in 1000 [1].

- Overall data on vasectomy failure in developing countries are few.
- One study in Nepal evaluated the effectiveness of vasectomy among couples and found that 25 of 924 men reported a pregnancy three months or more after surgery and seven reported pregnancies occurring within the first three months of surgery [2].

While some pregnancies may have occurred due to extramarital sexual contact, the authors did not believe this to be true, based on the Nepalese culture; however, questions concerning such acts were not asked of participants.

- The authors suggest that the rate of vasectomy failure and thus the rate of pregnancy after vasectomy are likely to be higher in developing countries due to a lack of effective occlusion techniques as well as the young age at which couples undergo sterilization [2].
- There is a lack of data available from rural areas of developing countries on the effectiveness of vasectomy.
- In addition, there is no information available on :
 - the perceptions of these pregnancies after vasectomy;
 - how did women become pregnant ?
 - what actions were taken :
 - was there proper documentation of the procedure ?
- Understanding how women are becoming pregnant after vasectomy - either from failed vasectomy or through extramarital affairs in the case of successful vasectomies will help us to better understand where to work on fixing the problem :
 - improving the quality of surgical and counseling services to men in developing countries who undergo vasectomy;
 - addressing the issue of extramarital affairs ;
 - and/or encouraging the use of other family planning methods in addition to or in place of vasectomy.
- In this study, we at SEARCH (Society for Education, Action and Research in Community Health), located in the rural and tribal Gadchiroli district of Maharashtra State in India, have made an attempt to shed light on the subject of vasectomy failures by focusing on the reactions and actions of the women who became pregnant after their husband's vasectomy.

Data Collection

- Data were collected from July 1986 to November 2019.
- Total number of women followed are 742.
- We collected data from women coming to our clinic, complaining of pregnancy after vasectomy.

- Data were gathered regarding,
 - when and where the vasectomy was performed;
 - the number of pregnancies occurring after vasectomy; and
 - the outcome of these pregnancies.
- Semen analyses were conducted to determine the true outcome of the vasectomy (*i.e.* success or failure) thereby leading us to question those women whose husbands had a successful vasectomy as to how they became pregnant.
- We followed the women seen in the clinic to discover not only their perceptions of the pregnancy, but also how they became pregnant if their husband was free of sperm and what action they sought after finding out they were unexpectedly pregnant.
- We talked to the husbands (whenever available) regarding their perceptions about the vasectomy operation and its failure.
- We never disclosed to the husband the results of semen report especially when it was a successful vasectomy; and this helped a lot to seek the women's confidence whenever they conceived from extramarital relation. That's why, most of the women confided in us the secrets of their private lives. All the information on this was collected by only one person – Dr. Rani Bang. Home visits were done by the social worker who was always seen by the women in the hospital, working closely with Dr. Rani Bang. So women confided in social worker also. Dr. Rani specifically told the women that the particular social worker will visit them at home on her behalf.
- Women selected for follow-up were those coming to the clinic for reproductive health care, including antenatal care and for seeking medical termination of pregnancy. (MTP).
- Upon arrival to the SEARCH clinic, a thorough history was obtained and women were asked about family planning methods including vasectomy.
- Those women, currently pregnant or ever pregnant after their husband's vasectomy (total n = 742) were included as part of the data collection.
- Demographic characteristics were gathered as well as information on when and where the vasectomy procedure was performed and reactions to the ensuing pregnancy. In the instance that woman became pregnant after a successful vasectomy operation, she was asked in confidence about the possibility of extramarital relation.
- While all of the data collected are based on clinic visits, the information provides insight into what might be happening in the communities on a larger scale. Thus, the data allow for future community-based studies to be developed to further investigate the medical, social and economical issues surrounding failed vasectomy procedures.

Results

Demographic Data

- Most of the women 97.71 % were currently married and living with husband (Table 1).

Table 1: Characteristic of Marital Status

Marital status	No	%
Married lives with husband	725	97.71
Married but separated	4	0.54
Widow	13	1.75
Total	742	100.0

- Generally women were 30-34 years of age. Mean age was 32.17(SD: 7.03) years. (Table 2)

Table 2: Age of Women

Age of the women	No	%
20 - 24	37	4.99
25 - 29	214	28.84
30 - 34	247	33.29
35 - 39	147	19.81
40 - 44	47	6.33
45 - 49	20	2.70
50 - 54	13	1.75
55-59	9	1.21
> 59	8	1.08
Total	742	100.0
Mean age is 3 2.17 (SD: 7.03)		

- 49.46% of women belonged to middle caste communities; yet a good number of women 32.61% also came from the tribal community. (Table 3)

Table 3: Different Communities

Caste	No	%
Scheduled Tribe	242	32.61
Scheduled Caste	114	15.36
Middle Caste	367	49.46
Others	19	2.56
Total	742	100.00

- When the women were asked as to why their husbands were willing to go for vasectomy, following responses came.
 - To get the money from the Government;
 - To get free alcohol for drinking in exchange of vasectomy;
 - Direct or subtle coercion by the government people;
 - Poor health of the wife;
 - No one at home to help the wife for doing household work;

- Tribal women told one interesting reason (which we confirmed with some men) – illicit sexual encounters of men at weddings and festivals and subsequent financial compensations to be paid for impregnating women outside of marriage. Thus husbands were more willing to go for vasectomy to protect their status and their economic position.
- 59.67% of women and 33.15% of men reported to be illiterate (Table 4).
- In terms of occupation, most of the women and men (79.78% and 82.48% respectively) said, they were farmers and/or agricultural labourer (Table 5).

Table 4 : Literacy Rate

	Education of Women		Education of Husband	
	No	%	No	%
Illiterate	442	59.57	246	33.15
1 - 4	79	10.65	159	21.43
5 - 7	49	6.60	87	11.73
8 - 10	126	16.98	157	21.16
11 - 12	40	5.39	56	7.55
> 12	6	0.81	37	4.99
Total	742	100.00	742	100.00

Table 5 : Occupations

	Occupation of Women		Occupation of Husband	
	No	%	No	%
House wife/work	127	17.12	1	0.13
Ag. Labour/Farmer	592	79.78	612	82.48
Business	3	0.40	43	5.80
Service	20	2.70	86	11.59
Total	742	100.00	742	100.00

Mean parity was 3.48 and mean gravidity was 4.47 (Table 6 A, B).

Table 6 A: Mean Parity

Para	No	%
0	2	0.27
1	9	1.21
2	187	25.20
3	229	30.86
4	167	22.51
5	88	11.86
6	34	4.58
7	13	1.75
8	9	1.21
>8	4	0.54
Total	742	100.00
Mean Para (s.d)	3.48 (1.42)	

Table 6 B : Mean Gravidity

Gravida	No	%
1	3	0.40
2	10	1.35
3	195	26.28
4	217	29.25
5	167	22.51
6	88	11.86
7	36	4.85
8	13	1.75
>8	13	1.75
Total	742	100.00
Mean gravida (s.d)	4.47 (1.45)	

Vasectomy surgery

- Of the 742 women followed after their husband's vasectomy, 83.83% reported, their husband underwent vasectomy surgery during a camp in which a traveling team of surgeons performed the operation and the remaining 16.17% reported the surgery as a routine operation. (Table 7)

Table 7: Vasectomy operation by its type

Characteristic	NO.	%
Routine operation	120	16.17
Vasectomy in capms	622	83.83
Total	742	100.00

- Of the total 742 women with pregnancy after the vasectomy, semen exam of the husband was done in 607 cases (81.8%); while it was not done in 135 cases (18.2%) (Table 8).

Table 8: Particulars of vasectomy operation by its type (n=742)

Characteristic	Particulars	Routine operation (n=120)		Vasectomy in camp (n=622)		Total (n=742)	
		No	%	No	%	No	%
Semen Examination	Not Done	25	20.8	110	17.7	135	18.2
	Done	95	79.2	512	82.3	607	81.8
	Total	120	100.0	622	100.0	742	100.0

- Semen exam in 607 cases showed that vasectomy failed in 64.6% of cases and was successful in 34.4 % of cases. (Table 9)

Table 9 : Particulars of vasectomy operation by its type (n=587)

Characteristic	Particulars	Routine operation (n=95)		Vasectomy in camp (n=512)		Total (n=607)	
		No	%	No	%	No	%
Report of Semen examination	Vasectomy successful	38	40.0	171	33.4	209	34.4
	Vasectomy failed	54	56.8	338	66.0	392	64.6
	Cases in which semen examined	3	3.2	3	0.6	6	1.0

- For surgeries taking place as a routine vasectomy operation, 56.8% were noted as failures and 66.0% of vasectomy surgeries taking place in a camp were identified as failures (Table 9).
- Therefore, there does not appear to be a significant difference in where the procedure took place, but rather shows a need to improve the overall quality of care provided.
- Further emphasizing the need to improve the quality of care provided, a disturbing 88.1% of all vasectomy patients, 81.7% and 89.4% from routine operations and camp respectively, did not know the name of the doctor performing the vasectomy. (Table 10).

Table 10 : Particulars of vasectomy operation by its type (n=742)

Characteristic	Particulars	Routine operation (n=120)		Vasectomy in camp (n=622)		Total (n=742)	
		No	%	No	%	No	%
Who did vasectomy operation?	Doctor name not known	98	81.7	556	89.4	654	88.1
	Doctor name known	22	18.3	66	10.6	88	11.9
	Total	120	100.0	622	100.0	742	100.0

This situation poses great difficulty for patients who may have had complications or an unsuccessful vasectomy and need to seek additional care or surgery or compensation.

- Only 2.0% of total 742 cases reported to have done vasectomy along with hernia / hydrocele operation. Majority 98.0% were plain vasectomy operations (Table 11).

Table 11: Particulars of vasectomy operation by its type (n=742)

Characteristic	Particulars	Routine operation (n=120)		Vasectomy in camp (n=622)		Total (n=742)	
		No	%	No	%	No	%
Was vasectomy done with Hydrocele/Hernia?	Yes	9	7.5	6	1.0	12	2.0
	No	111	92.5	616	99.0	727	98.0
	Total	120		622		742	

- Out of the total 742 cases, 25.7% reported having vasectomy at Gadchiroli civil hospital, PHCs level 72.5% reported having vasectomy operations (Table 12).

Table 12: Particulars of vasectomy operation by its type (n=742)

Characteristic	Particulars	Routine operation (n=120)		Vasectomy in camp (n=622)		Total (n=742)	
		No	%	No	%	No	%
Where Was vasectomy operation done?	PHC 's	77	64.2	461	74.1	538	72.5
	Gadchiroli district Hospital	39	32.5	152	24.4	191	25.7
	Chandrapur Hospital	1	0.8	1	0.2	2	0.3
	Gondiya	0	0.0	1	0.2	1	0.1
	Bastar / Sausar	0	0.0	2	0.3	2	0.3
	Govt. Medical Collage – Nagpur	1	0.8	0	0.0	1	0.1
	Warora	0	0.0	1	0.2	1	0.1
	Bramhapuri	1	0.8	4	0.6	5	0.7
	SEARCH	1	0.8	0	0.0	1	0.1

- In 392 cases of vasectomy where semen examination was done to see the success or failure of the procedure, there were 27.0% failures from PHC/civil hospital Gadchiroli and 16.8% failures from PHC Dhanora (Table 13).

Table 13: Semen test done but report is failure : where this operation done and their type of operation mode

Characteristic	Particulars	Routine operation (n=54)		Vasectomy in camp (n=338)		Total (n=392)	
		No	%	No	%	No	%
Where was vasectomy operation done?	Gondpipri, Chandrapur District.	0	0.0	3	0.9	3	0.8
	Armor PHC	0	0.0	11	3.3	11	2.8
	Chamorshi PHC	4	7.4	28	8.3	32	8.2
	Murumgaon PHC	1	1.9	3	0.9	4	1.0
	Civil hospital , Gadchiroli PHCs	16	29.6	90	26.6	106	27.0
	Dhanora PHC	11	20.4	55	16.3	66	16.8
	Delanwadi PHC	0	0.0	7	2.1	7	1.8
	Mul PHC	3	5.6	12	3.6	15	3.8
	All other places	19	35.2	129	38.2	148	37.8
	Total		54	100.0	338	100.0	392

Both the Tables 12 and 13 throw the light on the poor quality of services at district headquarter hospital and Dhanora PHC, only 17 kms away from Gadchiroli and mostly caters to tribal people around.

•When we looked at the number of pregnancies after vasectomy procedure, we found that :

-maximum number of conception was one in 74.4% cases; and two in 18.5% of cases. (Table 14)

But there were also, -

x44 women with 3 conceptions,

x4 women with 4 conceptions and

x3 poor women with 5 conceptions.

Table 14 : Particulars of vasectomy operation by its type (n=742)

Characteristic	Particulars	Routine operation (n=120)		Vasectomy in camp (n=622)		Total (n=742)	
		No	%	No	%	No	%
Number of pregnancies after vasectomy	1	95	79.2	457	73.5	552	74.4
	2	16	13.3	121	19.5	137	18.5
	3	8	6.7	36	5.8	44	5.9
	4	1	0.8	3	0.5	4	0.5
	5	0	0.0	3	0.5	3	0.4
	Missing	0	0.0	2	0.3	2	0.3
	Total		120		622		742

Overall, regardless of whether vasectomy was performed as a routine operation or in a camp, 64.6% of surgeries were deemed failed vasectomies after semen analysis.

It should be noted that information is not available on the surgical procedure used as the couples were unable to tell. But we assume that being a resource poor area, older methods of performing vasectomy were likely to have been a standard procedure.

In addition, none of the patients were counseled on the need to wait or to use other contraceptive method for three months after the vasectomy surgery before participating in unprotected sex. Thus, some vasectomy failures may have been due to a lack of adherence to this waiting period because of inadequate counseling and not due to surgical failure.

For the purpose of this data analysis, all men with sperm detected during semen analysis were considered vasectomy failures. Those pregnancies, that occurred in couples where the vasectomy was found to be successful were suspected to have been a result of extramarital sexual contact.

How women become pregnant after vasectomy ?

In an attempt to identify those pregnancies due to vasectomy failure and those due to extramarital sexual contact, semen exam was done.

There were a total of 392 pregnancies in which the vasectomy was found to have been a failure and 209 pregnancies in which the vasectomy was successful. (See Table 9).

Among the remaining 135 pregnancies it was not known whether the vasectomy was a success or failure. (See Table 8)

Of the 209 pregnancies occurring when the vasectomy

was successful, ten were reported within the same year as the vasectomy surgery and six one year after surgery but within two years.

Other research has reported that vasectomy has most often failed within two years of surgery [3]. Thereby making it possible that these 16 pregnancies are due to vasectomy failure. However, the remaining 165 pregnancies, occurring two years or later after vasectomy, are more likely to be a result of extramarital sexual contact. Table 15 : How did patient became pregnant when vasectomy was successful (n=209)

Table 15 : How did patient became pregnant when vasectomy was successful (n=209)

Reason	No	%
Extramarital contact	209	100.0
Total	209	

Interestingly, five women said, 'the man came in her dreams and so she became pregnant.'. But on further probing they agreed to having extramarital sexual relation.

Some more interesting findings regarding this extramarital sexual partner are shown in (Table 16).

-51.7% of women had extramarital contact with a relative; mostly a near one.

-42.1% of women had extramarital contact with outside relatives and 5.3% were unmarried boys!

Table 16 : Partner in extramarital contact

Type	No. (Multiple answers)	%
Extramarital contact outside relatives	88	42.1
Extramarital contact with relative	108	51.7
Unmarried young boy	11	5.3
Younger married man	27	12.9

•As seen in Table 17, most women i.e. 607 (both with successful and failed vasectomy), sought medical termination of

pregnancy.(MTP)at either SEARCH or another location.

Somewhat surprisingly, many women (132) also continued the pregnancy and reported delivering a baby, even in situations where the vasectomy was successful, thus taking on the responsibility of caring for another child. It should be noted that some women have become pregnant more than once after a failed vasectomy, thereby making the number of additional children born higher than that reported.

Table 17 : Major outcome of current pregnancy

Major characteristics	Operation successful (n=209)		Operation failed (n=398)		No semen test done (n=135)		Total (n= 742)	
	No	%	No	%	No	%	No	%
Normal Delivery	48	22.97	73	18.34	11	8.15	132	17.79
Criminal abortion	41	19.62	32	8.04	15	11.11	88	11.86
MTP at place other than SEARCH	64	30.62	127	31.91	6	4.44	197	26.55
MTP at SEARCH	15	7.18	49	12.31	4	2.96	68	9.16
Information not available	41	19.62	117	29.40	99	73.33	257	34.64
Total	209	100.00	398	100	135	100	742	100

•Out of the 132 normal deliveries, Pregnancy outcome in these 132 deliveries was as follows :-

- Baby alive in 115 cases,
- Stillbirth in 7 cases;
- Early neonatal death in 10 children,

•Thus, in analyzing the data in which women had ever been pregnant after vasectomy were included, it was found that a total of 115 additional children were born due to either vasectomy failure or extramarital contact.

Reactions to Pregnancy after Vasectomy

•As vasectomy is expected to be a permanent means of birth control, women and their husbands were asked how they felt about the pregnancy after vasectomy.

•For those women who became pregnant after their husband's vasectomy, the reaction was dependent on whether the operation was found to be a success or a failure.

•In 209 cases, where semen exam showed operation to be successful, all the women had a sense of shame and guilt feeling due to extramarital relation. All of them were scared and begged us not to disclose the fact to their husbands. Surprisingly, not a single man came to enquire about the report of the semen testing. Dr. Rani only disclosed the result to the husband when the operation had failed and counseled the couple to go for another contraceptive protection.

•In 398 cases, where semen exam showed vasectomy failure, the responses were as follows : (Table 18, A+B)

- 62.8% of men and 35.0% of women were very annoyed.
- Two women had intense anxiety.
- While one man was very much surprised the other one

coolly said, "all in the village have child after operation."

-But the most surprising thing was 36.6% of men and 64.4% of women did not give any immediate reaction. When probed, everyone said, "It's my destiny!"

We feel, these poor people find themselves so helpless that they don't even react!

Table 18 A: Husband's reaction when operation fails

	No	%
Very disturbed	194	62.8
all have child after operation in the village	1	0.3
very surprised - beats wife	1	0.3
not mention anything	113	36.6
Total	309	100.0

Table 18 B: Wife's reaction when operation fails

	No	%
patient annoyed	108	35.0
anxiety	2	0.6
Not mention anything	199	64.4
Total	309	100.0

Additional Family Planning methods and actions taken :-

- 607 women in whom semen exam was done after the pregnancy following the vasectomy, were followed to seek information on the additional family planning methods and actions.

The results are shown in Table 19

Table 19: Particulars of Family Planning Methods Used

Any Family planning Method use.		Vasectomy successful	%	Vase. Fail	%	Total	%
		n=209		n=398		n= 607	
1	Laparoscopic Tubectomy done	2	0.96	6	1.51	8	1.32
2	Abdominal tubectomy done	19	9.09	109	27.39	128	21.09
3	Patient took traditional medicine	1	0.48	5	1.26	6	0.99
4	Vasectomy done	0	0.00	1	0.25	1	0.16
5	Patient wanted abdominal tubectomy but doctors in civil hosp. refuse but to anemia	0	0.00	1	0.25	1	0.16
6	Cu_T inserted in	0	0.00	5	1.26	5	0.82
7	Patient Separated from husband	0	0.00	0	0.00	0	0.00
8	not use any method	9	4.31	9	2.26	18	2.97
9	Condom	0	0.00	1	0.25	1	0.16
10	Vasectomy, tubectomy, copper-T all method use but failed.	0	0.00	1	0.25	1	0.16
11	Information not available	178	85.17	260	65.33	438	72.16
Total		209	100.00	398	100.00	607	100.00

- Information could not be obtained in 72.16% of cases.
- 22.41% of women went for tubectomy while one man got re-vasectomy done.
- Thus, in spite of the failure, sterilization remained to be the most popular method of birth control.

Discussion

- All of these findings compiled by SEARCH demonstrate that vasectomy as a means of sterilization is not completely effective as it should be.
- Counseling and surgical skills both seem to be a problem.
- Extramarital sex resulting in some pregnancies after vasectomy is a disturbing fact.
- This issue of extramarital sex poses a moral dilemma for some doctors in that disclosure of the act might result in physical or verbal abuse towards the wife because she went outside of the marriage. It may also result in marital disharmony leading to separation.
- Extramarital sex also becomes a risk factor for acquiring sexually transmitted diseases and HIV infection.
- Furthermore, the use of MTP as a means of birth control seems to be re-informed as women who become pregnant outside their marriage due to lack of additional birth control methods have few other options.
- In those cases where vasectomy failed, patients should be able to seek compensation as couples are thrust into a position of caring for an additional child unexpectedly.

Unfortunately, most patients going for vasectomy were unaware of the physician performing the procedure and were not given any written record that the procedure was completed.

- Couples need to be counseled on the possibility of pregnancy after vasectomy within the first three to four months of surgery.
- Couples should insist upon the written documentation of the surgery so if there is a failure in the future, they can return to the same doctor to seek compensation.
- Additional community-based research should be conducted on the efficacy of the different procedures used in performing vasectomy as well as the consequences of failed vasectomy on the men and women involved.
- Furthermore, research needs to address the quality of care provided to men undergoing vasectomy, including counseling and legal components, particularly during surgical camps in rural areas of India.

References

- 1) Haldar N, Cranston D, Turner E, Mackenzie I, Guillebaud J. How reliable is a vasectomy ? Long-term follow-up of vasectomised men. The Lancet 2000;356.
- 2) Nazerali, Hanif, Thapa, Shyam; Hays, Melissa; Pathak, Laxmi R; Pandey, Kaylan R : Sokal, David C. Vasectomy effectiveness in Nepal : a retrospective study. Contraception 2003; 67:397-401.
- 3) Jamieson DJ, Costello C, Trussell J, Hillis S, Marchbanks PA, Peterson HB, for the US collaborative Review of Sterilization Work Group. The Risk of Pregnancy after Vasectomy. Obstetrics and Gynaecology 2004;103:848-850.