

**BELIEF ABOUT CAUSATION OF DISEASES AND PREFERENCE OF
UTILIZATION OF HEALTH AGENCIES BY ELDERLY PERSONS IN
AN URBAN COMMUNITY**

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ABSTRACT

In this paper, the belief about disease causation and the preference of source of treatment in aged people of an urban area of Meerut City were studied. The findings revealed that 82.8 per cent aged believed in Rational Causation and 85.0 per cent used modern medicine as their initial source of treatment. The fact that 6.0 per cent aged thought disease causation as deistic/demonist and 0.9 per cent tried to treat sickness by religious offerings, which necessitated the need of health education for the aged,

Utilization of the health services is a complex phenomenon which, on one hand, is influenced by the belief about causation of diseases and thereby prompting a person to take a decision to utilize various available health agencies and on the other hand by the availability, accessibility and organizational aspects of health services system. Such information is also important in planning and organizing health care services to the community. The belief of elderly persons regarding utilization of health services also influences the other members of the family in this respect especially in the areas where joint family system is predominant over nuclear family system.

This study was conducted in an urban community of Meerut city with the objectives (i) to know the various beliefs about the causation of disease in the elderly; and (ii) to study the utilization of various available health agencies.

Material and Methods

The study was carried out in the urban field practice

area of the Department of Social and Preventive Medicine, L.L.R.M. Medical College, Meerut. All the persons aged 50 years and above in 500 registered families constituted the study universe.

There were 349 aged people in the area, of which 333 (90.8 per cent) responded to the inquiries. The information was collected on the preformed interview schedule which included the demographic characteristics, belief about causation of diseases, in general, and utilization of health agencies. The utilization of health agencies was assessed in terms of primary source of treatment which was utilized most frequently in case of sickness.

Results

Demographic Characteristics: The total population of study area was 3,209 of which 349 persons (9.2 per cent) were categorized as aged. These aged were residing in 221 families out of which 210 (95 per cent) families having 333 aged could be covered. The average family size was 5.8 person per family but the component of aged person per family was 1.6, 226 (67.6 per cent) were residing in joint families.

The belief about causation of disease and preference for utilization of health agencies were analyzed in relation to literacy status, keeping in view the general opinion that education has a role in deciding the both.

Belief about Causation of Diseases: The belief about causation of disease was classified into diestic/demonistic, tridosa and rationale and was analyzed in relation to the literacy status of the aged as given in Table 1. It is evident from the data presented that 82.3 per cent elderly believed the causation of disease to be rationale. The percentage of aged who had a rationale belief about disease causation increased with the rise in educational status except for those who were illiterate and had better understanding of the disease than those who were either just literate or educated upto primary level. A positive association with increasing literacy status and rationale belief was found ($p = <0.001$).

Utilization of Health Agencies

There were total 31 health care institutions in the

TABLE 1
BELIEF ABOUT CAUSATION OF DISEASES

Literacy Status	Diestic + Demonistic (Supernatural)	Tridosas	Rationale	Total	
				Number	Percentage
Illiterate	7	13	76	96	28.8
Literate + Primary	7	22	59	88	26.4
Junior High School + High School	4	3	78	85	25.6
Inter and above	2	1	61	64	19.2
Total	20	39	274	333	100.0
Percentage	6.0	11.7	82.3	100.0	

$$X^2 = 30.30$$

$$d.f. = 3$$

$$P = <0.001$$

For the purpose of calculation rationale and others only.

X^2 values the beliefs were considered as

area of which only 3 were Government Institutions (UHC, IDH and a dispensary) rest were private agencies. Among the private agencies; 12 were the practitioners of modern medicine while rest 16 was either practitioners of Ayurvedic or of Homoeopathic system. Besides these the aged of the area were also receiving health care through nearby CGHS dispensary, ESI dispensary. Medical College and District Hospital.

In order to get an idea about general pattern of utilization of various health care agencies, the respondents were asked to mention the primary source of medical care which they generally utilized during sickness and their responses are given in Table 2. The majority of aged (38.1 per cent) were utilizing the services of practitioners of modern medicine followed by 25.2 per cent and 21.7 per cent using services of hospital and urban health centre respectively. Thus a total of 85.0 per cent of the aged initially sought treatment of modern medicine when fell sick. A significantly increasing positive association between the educational status of the patients and their utilization of services of modern medical practice was also observed ($p = <0.001$).

In general, out of 20 people considered belief about disease causation as supernatural powers while only 8 (40 per cent) of them preferred to utilize the services of indigenous medicine or religious offerings. Similarly, out of 27 having faith in Tridors theory, 12 (44 per cent) were still utilizing the services of modern medicine as shown in Table 3.

Discussion

"The aged often deny pain to avoid examination" said Clifford All butt. This may be true in many cases but what is more true is that many conditions are not conveyed to the physicians because the aged and also the members of their families think them to be natural of old age¹. Therefore many conditions remain untreated and unreported till those become complicated. Though the study was not directed towards investigating this problem, the fact that 6.0 per cent aged persons believed in deistic/demonistic theory further strengthens this statement. Encouragingly, majority of aged 82.3 per cent believed in rationale theory of the disease causation.

TABLE 2
UTILISATION OF HEALTH AGENCIES

Literacy Status	Urban health centre college	Hospital (including medical modern medicine	Practitioner of modern medicine	Indigenous	Religious offering	Total Number	Percent
Illiterate	26	21	33	16	-	96	28.8
Just Literate + Primary	24	19	23	20	2	88	26.4
Junior High School + High School	13	24	41	6	1	85	25.6
Inter and above	9	20	30	5	-	64	19.2
Total	72	84	127	47	3	333	100.0
Percentage	21.7	25.2	38.1	14.1	0.9	100.0	

$$X^2=24.8 \quad \text{d.f.} = 3 \quad P = <0.001$$

For the purpose of calculating the utilisation modern was categorised into medicine and others.

TABLE 3
BELIEF ABOUT CAUSATION OF DISEASE IN RELATION TO
PREFERENCE FOR UTILISATION OF HEALTH AGENCIES

Belief	Preference for Health Agencies					Total
	Urban Health Centre	Hospital including Medical College	Practitioner of modern medicine	Indigenous medicine	Religious offering	
Diestic	6	-	4	4	2	16
Demonistic	-	-	2	1	1	4
Tridosha	4	3	5	27	-	39
Rationale	62	81	126	15	-	274
Total	72	84	137	47	3	333

Eighty five per cent old age respondents were primarily utilizing the services of modern medicine inspite of the fact that 82.3 per cent believed in rationale causation of disease. In other study it was reported that only 27.3 per cent patients had utilized some agency of modern medicine before seeking treatment at a Medical College Hospital². Interestingly, though 6.0 per cent aged believed in supernatural causation of disease, only 0.9 per cent aged resorted to the religious offerings. It was also observed that 1.2 per cent aged at New Delhi tried to treat themselves with religious offerings[^]. Preference for private practitioners for consultation at the time of sickness in an urban locality has also been reported* and observations of this study are also in conformity with the findings of these workers.

It can, therefore, be said that the mere fact that particular individual and his/her family is entitled for a specific medical care scheme, does not mean that the members will be utilizing health care services from that source only. On one hand the choice of medical care depends on factors like availability, convenience, expenditure involved, the quality of services provided while on the other hand the belief regarding the causation of disease also play a very important role in its determination. The education of the people about health is, therefore, of paramount importance in persuading the people to make proper utilization of available medical facilities, more so that of aged people as their advice is sought in all the matters pertaining to the family health in our present social set up.

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इस पेपर में मेरठ शहर के एक शहरी क्षेत्र में वृद्ध लोगों में बीमारियों के कारण के विश्वास व उपचार के स्रोत की वरीयता का अध्ययन किया गया था। निष्कर्षों से पता चलता है कि 82.8 प्रतिशत वृद्ध तार्किक कारकों को व 84 प्रतिशत आधुनिक औषधियों को अपने उपचार का प्राथमिक स्रोत मानते हैं। इस तथ्य को देखते हुए कि छह प्रतिशत वृद्ध बीमारियों के कारण डाइस्टिक/डिमोनिस्टिक तथा 0.9 प्रतिशत रूग्णता का धार्मिक प्रार्थनाओं से उपचार करने के प्रयत्न करते हैं, वृद्ध लोगों के लिए स्वास्थ्य शिक्षा की अत्यन्त आवश्यकता है।

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**PERCEIVED MORBIDITY, MEDICALLY DEFINED MORBIDITY,
POPULATION TYPOLOGY AND ITS RELEVANCE IN
PLANNING OF HEALTH SERVICES**

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ABSTRACT

111 healths in the individual can be understood as disturbance in one or more sub-systems, in biological or medical defined illness or in perceptive sub-system on the basis of subjective evidence perceived sickness.

For each concept of illness medical or perceived there is corresponding concept of need for health services. Thus population can be divided in four types depending upon health need and different type of health services appropriate to their need can be designed. The planning of health services has been discussed in this paper.

Health needs are operationally defined as the difference between the observed and the ideal levels of health. The information about the need for health services is necessary for planning of health services and appropriate allocation of resources. The attainment of appropriate balance between the resources, need and use of health services is an important goal of any health service system. The indications of health service system should reflect true and perceived need of health services.

The present study was undertaken in order to scrutinize how the information obtained during various health surveys can be utilized to formulate an indicator of health service need.

Materials and Methods

The data used in the study pertains to previous general health surveys carried out in slums of Nagpur city, survey of 43 villages around Saoner town and study on perceived morbidity

and health services utilization in rural area. The information collected in these three different surveys was common in all three studies with variations in certain additional factors. Morbidity data was analyzed according to perception of illness and medically defined illness.

Observations

As the morbidity has a subjective element, many people feel that they are ill when in fact they may not be having any clinical evidence as shown in Table 1. On the other hand, many others who feel that they are not sick, might actually show morbidity on examination. In order to see whether any association exists between perceived morbidity and medically defined morbidity X2 test was applied and the test revealed strong association between two factors.

Perceived sickness rate and medically defined sickness rate in different age groups have been given in Table 2. It is observed that for total population perceived morbidity rate is 176.7 per thousand population and medically defined sickness rate 138.1 per thousand populations.

However, age wise distribution of these rates show that the medically defined illness is 2.24 and 3.6 times higher in infants and children of 1-5 year age group. If perceived sickness rate as an indicator used here for need of health services, it underestimates the true health needs of children. The age group of 5-55 years presents an entirely different picture.

It may be noted from Table 3 that the medically defined sickness which is not perceived as health need, fall largely in the category of nutritional deficiency diseases, communicable diseases and chronically non communicable conditions. If all these diseases can be identified early enough, then the intervention is easy and some can be totally prevented, while rest gets the benefit of early diagnosis and treatment.

Discussion

Ill health in the individual can be understood as disturbance in one or more sub-systems. For example biological system on the basis of clinical evidence (medically defined illness) or in the perceptive sub-system on the basis of subjective evidence (perceived need). The perception of illness

TABLE 1
ASSOCIATION BETWEEN PERCEIVED MORBIDITY AND MEDICALLY DEFINED MORBIDITY

Medically defined morbidity	Perceived Yes	Morbidity No	Total
Yes	396	190	586
No	26	143	169
Total	422	333	755
X^2 75.5	d.f. 1	P<0.001	

TABLE 2
SICKNESS RATE PER THOUSAND POPULATION FOR PERCEIVED AND MEDICALLY IN VARIOUS AGE GROUPS

Age group	Sickness rate per thousand	
	Perceived sickness	Medically defined sickness
0 - 1	434.9	976.1
1 - 5	210.1	756.3
5-15	243.3	33.3
15 - 55	128.8	26.1
	207.8	139.3
55 and above		
Total	176.7	138.1

TABLE 3
PATTERN OF MEDICALLY DEFINED SICKNESSES WHICH ARE NOT PERCEIVED

Sr. No.	Name
1.	Protein Calorie Malnutrition
2.	Vit. 'A' Deficiency
3.	Leprosy
4.	Hypertension and Diabetes
5.	Congenital Heart Disease
6.	Other miscellaneous

and not the disease prompts an individual to utilize health services hence perceived sickness is an important indicator of health need. The perception of illness differs to a great extent in different categories of population or communities depending upon the sensitivity of the individuals, and from the facts that different individuals or communities may make a varying degree of allowances for deviation from the state of health. Especially in India where man is accustomed to various types of hardship, the sensitivity to health is necessarily lower where the life is easier and health consciousness is more.

Under certain circumstances the individual is in a state of compensatory health, but the condition may or may not be perceived by the individual, may not be clinically recognizable but can be diagnosed by certain tests.

Thus the health need can be the difference between observed level of health (medically defined need) and health values and ideal level of health (reflected as perceived health need).

A wide variety of indicators are used in different health service system. If the plan is disease oriented programme for specific population group it may be sufficient to obtain the information about the incidence of disease and risk factors. However, if objective is to plan health policy for total population in the country more comprehensive information must be made available and the indicators should be more comprehensive indicating both perceived as well as medically defined need.

Thus, for each concept of illness medical or perceived, there is a corresponding concept of need for health service resulting from the morbidity. Although the immediate policy of health service is to satisfy medically defined need, in practice it has to satisfy perceived need also. On the basis of these different indicators of need it is possible to define the typology of population, each type corresponding to different concept of need.

The distribution of population according to need has been shown in Table 4. For the persons belonging to box 'a' and 'd' the indicators of both concepts of need give same answer. Those who perceive sickness use health service and have medi-

TABLE 4
 TYPOLOGY OF POPULATION ACCORDING TO INDICATORS OF
 CONCEPTS OF NEED OF HEALTH SERVICES

Perceived need	Medically defined need	
	Yes	No
Yes	a. Unanimous need	b. Unjustified perceived need
No	c. Hidden medically defined need	d. No need

cally defined need too. On the contrary those who neither perceive sickness nor have medically defined need belong to box'd*. Box 'b' comprises of the individuals who perceive need for health service as they consider themselves sick, although they do not have any medically diagnosable conditions. For this reason their perceived need is labeled as unjustified in the diagram but this refers only medical aspect of the need. It does not imply that perceived need would necessarily have lower priority than other types.

Box 'c' comprises of persons who do not perceive or reflect in their behavior the need for health services but who have hidden disease. A fairly large proportion of population falls into this group. The proportional distribution of the population in these four categories probably varies from place to place.

The four boxes in this table indicate the different groups in population and appropriate health services. It seems that according to need the planning of appropriate health services is possible. As already referred in Table 1, that there is good co-relation between perceived morbidity and medically defined morbidity; the active use of health services, curative or preventive is observed and thus no special efforts are required for this group.

The population in box 'd', having neither medically defined nor perceived need can be considered as absolutely healthy population. Certain health promotional services like health education, nutrition education, promotion of environmental health immunization etc. are indicated. These services aim at overall health promotion and maintenance. Investment in these services will in long run pay rich dividend.

The fourth population category is one belonging to box 1 c'. This is asymptomatic group having medically defined morbidity. The reason for ill perception of disease may vary from social causes, ignorance, and poverty to biological. It will be interesting to find out the pattern of this illness, which are ill perceived. The conditions observed in this group are protein energy malnutrition, vit. 'A' deficiency, leprosy, tuberculosis, hypertension, diabetes, congenital heart disease, visual defects. An intensive health educational drive in all these aspects is necessary. It should include warning signals, importance of early diagnosis and treatment, availability of appropriate services. This creates awareness in public which motivates them to cooperate in early detection programme, screening programme.

However, it is rather difficult to plan extension programme for entire population on variety of problems. Thus, it becomes imperative to select certain high risk age groups, a vulnerable section in population.

It may be observed from Table 2 that the true need of health services is maximum in under five but their perception of ill health is poor, thus forms a more vulnerable group which can escape the attention of medical man. The relationship between the perceived morbidity and medically defined morbidity as observed in Table 1 does not hold good for this group of population. Perceived morbidity as an index of health need underestimates the true need. Thus a special active screening programme is necessary.

It may thus be concluded from table 5 that depending on the perceived need and medically defined need of health services, population can be divided into four categories.

TABLE 5
TYPOLOGY OF POPULATION BASED ON PERCEIVED AND
MEDICALLY DEFINED NEED AND APPROPRIATE HEALTH
SERVICES

Perceived need	Yes	Medically defined need No	
Yes	Sick: Use health services	Perceived need Use health services	
No	Hidden morbidity need for screening	Health No use Health promotional services	

This typological division facilitates the planning of appropriate services. However, though perceived need has good correlation with medically defined need, the relationship does not hold good for younger age groups, children.

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कसी व्यक्ति के अस्वस्थ होने को उपलब्ध प्रत्यक्षीकृत बीमारी के आधार पर जैव वैज्ञानिक या चिकित्सकीय परिभाषित बीमारी के अनुसार एक या अधिक उप-तंत्रों अथवा अनुभव किये जाने वाले उप-तंत्र में गड़बड़ी मानकर समझा जा सकता है।

हर चिकित्सकीय या प्रत्यक्षीकृत रोग धारणा के साथ स्वास्थ्य सेवाओं की आवश्यकता की अवधारणा बनी हुई है। इस प्रकार स्वास्थ्य की आवश्यकता के आधार पर जनसंख्या को चार भागों में विभाजित किया जा सकता है और आवश्यकतानुकूल विभिन्न प्रकार की स्वास्थ्य सेवाओं की संरचना की जा सकती है। इस पेपर में स्वास्थ्य सेवाओं के नियोजन की चर्चा की गई है।

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**A LONGITUDINAL FOLLOW-UP STUDY OF WOMEN UNDERGOING
LAPAROSCOPIC TUBAL LIGATION IN LUDHIANA BLOCK OF
PUNJAB**

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ABSTRACT

With a view to study the demographic profile and fertility pattern of acceptors and to find out the post-operative complications, particularly failure, if any, 374 cases of voluntary tubal ligation with the Falope Ring, using the laparoscopic technique, performed in family planning camps in various centers in the Ludhiana (Sahnewal) Block of Ludhiana District of Punjab, were followed up . over 2 years for varying periods but not less than 6 months. Findings revealed that 50.8 per cent of acceptors of this facility were scheduled caste women and 65.5 per cent of the acceptors were over 30 years old. A majority of the women, and particularly the under-privileged scheduled caste, accepted laparoscopic tubal ligation after having 4 or more living children of which two or more were male. The women most commonly accepted sterilization within 12 months of having the last male child. Shoulder pain and menstrual problems were the most common post-operative complications, and the failure rate was found to be 0.53 per cent. The study further revealed that whereas laparoscopic tubal ligation is a safe, effective and acceptable method of sterilization, the demographic profile and fertility pattern of acceptors show that it cannot be expected to influence the birth rate, and hence it is suggested that more vigorous efforts to popularize acceptance of methods other than sterilization particularly in the younger age-group will have a bigger impact on reducing the birth rate, than the present target-oriented sterilization campaigns.

Laparoscopic tubal ligation is a useful tool for the developing countries in their war against an alarmingly high

population growth. This method has been enthusiastically received both by the health care "providers" as well as by the health care "consumers". The reasons for this acceptance are the many advantages this method enjoys over the conventional approaches, viz., a short operating time, low patient cost, reduced hospital stay, and short post-operative recovery period, to list a few*.

The implementation of the Reorientation of Medical Education (ROME) scheme by the Ludhiana Christian Medical College led to the Ludhiana (Sahnewal) Block of this district being attached to this Institution, with technical supervision and support being provided by the Department of Social and Preventive Medicine and Community Health. Laparoscopic sterilization using the Falope ring was introduced in this block in October 1982. Up to December 1984 over 2,800 operations were performed using this technique, through a number of camps organized by the Government health services in rural areas of the Ludhiana block.

Review of Literature

Laparoscopic sterilization was first performed in USA by Anderson in 1937². The procedure was described in Europe in 1964 by Frangenheira³, and popularised in Britain by Steptoe⁴. Steptoe (1970) reported a failure rate of 0.2 per cent for this technique. Yoon and Poliakoff (1971) reported a failure rate of 0.91 per cent for the Falope ring technique as mentioned in other studies-*. In India, failure rate of this method has been reported to be 0.74 per cent by Sharma et al. (June 1984) following a study carried out in Kashmir⁶. It would have been interesting to know the period of follow-up in their study. Sharma et al. have referred to the failure rate of 1.4 per cent reported by Argneta et al. in 1980⁶. Post-operative complications following tubal ligation have been reported⁷, who found that the most common post-operative problems were menstrual 32.71 per cent, abdominal and pelvic pain 19.93 per cent, leucorrhoea 17.65 per cent, backache 14.3 per cent, psychological disturbances 10 per cent, pelvic inflammation 8.34 per cent and failure 0.97 per cent.

Objectives of the Study

The objectives of the study were (a) to study the demographic profile and fertility pattern of acceptors of laparo

scopic tubal ligation in order to facilitate proper selection of cases; and (b) to find out the post-operative complications, particularly the failure rate of this method under local circumstances .

Materials and Methods

A 2 years' longitudinal study was done in which 374 cases of rural acceptors of laparoscopic tubal ligation were followed up for a period of at least 6 months: 194 cases for 24 months or more, 72 for 18 -<24 months, 81 for 12-<18 months and 27 for 6-<12 months as shown in Table 1. The sterilizations were performed in family planning camps in various centers in the Ludhiana block. Information was obtained on a prescribed proforma through personal contact between the acceptors and the investigators, by means of routine home visits. Such visits are part of the comprehensive health care delivery methodology based on the family-folder system developed by the Department of Social and Preventive Medicine and Community Health of the Ludhiana Christian Medical College. This system is operational in field practice areas of this department for the last more than five years, and was extended to the Ludhiana block in 1981-82 following the implementation of the *ROME* scheme. Every family in each village in the block is visited once every 6-8 weeks and more often if required. A complete up-dated health profile of each family is readily available in the family folder. Details regarding steps involved in the procedure were not available, since data was obtained from individual acceptors through interviews during home visits.

Observations

The age and caste distribution of acceptors under study is given in Table 2. The majority (50.8 per cent) of the acceptors were found to be from under-privileged rural scheduled caste families. This tallies with the findings of other studies^{9,10}.

Of all the acceptors 5.6 per cent were <25 years old, 28.9 per cent, 25-< 30 years old, 40.1 per cent 30- <35 years old and 25.4 per cent were 35 or more years old. Therefore, 65.5 per cent of the acceptors were over 30 years old while 34.5 per cent were under 30. Significantly, scheduled caste acceptors made up 51.8 per cent of the 25-< 30 years age-group, but only 33.33 per cent of the < 25 years age-group.

TABLE 1
DISTRIBUTION OF ACCEPTORS ACCORDING TO PERIOD OF FOLLOW-UP

Period of follow-up	Scheduled Caste	Non-Scheduled Caste	Total
6- < 12 months	11	16	27
12-< 18 months	48	33	81
18- < 24 months	37	35	72
24 months or more	94	100	194
Total	190 (50.8%)	184 (49.2%)	374 (100%)

TABLE 2

AGE AND CASTE	DISTRIBUTION OF ACCEPTORS					
Age of acceptors	Scheduled Caste (SC)		Non-Scheduled Caste (NSC)		Total	
	No.	Row Percentage	No.	Row Percentage	No.	Column Percentage
<25 years	7	(33.33%)	14	(66.66%)	21	(5.6%)
25-< 30 years	56	(51.8%)	52	(48.1%)	108	(28.9%)
30-< 35 years	84	(56.0%)	66	(44.0%)	150	(40.1%)
35 years or more	43	(45.3%)	52	(54.7%)	95	(25.4%)
Total	190	(50.8%)	184	(49.2%)	374	(100%)

The distribution of acceptors according to the number living children they had at the time of acceptance of sterilization is given in Table 3. Of the scheduled caste acceptors 69.5 per cent had 4 or more children at the time of acceptance of sterilization, 26.3 per cent had 3, 4.2 per cent had 2 and there were no acceptors of the "one-child norm". The findings of the study are in conformity with those who reported the average number of children to be 4.84 and 5 respectively¹¹.

The distribution of acceptors according to the number of living male children at the time of sterilization is given in Table 4. No woman accepted sterilization without having a male child, 92.1 per cent of the scheduled caste acceptors, and 87.5 per cent of the non-scheduled caste acceptors, had 2 or more living male children at the time of tubal ligation.

Distribution of acceptors according to age and sex of the youngest child at the time of tubal ligation is given in Table 5. The importance of the male child is further demonstrated by the fact that at the time of sterilization, in 63.68 per cent of scheduled caste acceptors the youngest child was a male, of which 43.8 per cent accepted sterilization within 1 year of having this male child. Similarly, in 74.4 per cent of the non-scheduled caste acceptors the youngest child was a male, of which 34.31 per cent were those in which this youngest male child was less than 1 year old.

TABLE 3
DISTRIBUTION OF ACCEPTORS ACCORDING TO NUMBER OF LIVING
CHILDREN AT THE TIME OF TUBAL LIGATION

Age of acceptors	Scheduled Caste (SC)					Non -Scheduled Caste (NSC)				
	1	2	3	4 or more	Sub Total	1	2	3	4 or more	Sub Total
< 25 years	0	2	2	3	7	0	5	7	2	14
25- <. 30 years	0	2	28	26	56	0	5	23	24	52
30-£ 35 years	0	3	18	63	84	0	11	21	34	66
35 years or more	0	1	2	40	43	0	5	14	33	52
Total	0	8	50	132	190	0	26	65	93	184
		(4.2%)	(24.3%)	(69. 5%)	(100%)		(14.13%)	(35.3%)	(50. 5%)	(100%)

TABLE 4

DISTRIBUTION OF ACCEPTORS ACCORDING TO NUMBER OF LIVING
MALE CHILDREN AT THE TIME OF TUBAL LIGATION

Age of acceptors	Scheduled Caste				Non -Scheduled Caste			
	No. of living male children			Sub Total	No. of living male children			Sub Total
	0	1	2 or more		0	1	2 or more	
<25 Years	0	1	6	7	0	2	12	14
25-<30 years	0	4	52	56	0	10	42	52
30- < 35 years	0	4	80	84	0	5	61	66
35 years or more	0	6	37	43	0	6	46	52
Total	0	15	175	190	0	23	161	184
		(7.9%)	(92.1%)	(100%)		(12.5%)	(87.5%)	(100%)

TABLE 5

DISTRIBUTION OF ACCEPTORS ACCORDING TO AGE AND SEX OF
YOUNGEST CHILD AT THE TIME TUBAL LIGATION

Age of the youngest child	Scheduled Caste			Non -Scheduled Caste		
	Male	Female	Sub Total	Male	Female	Sub Total
1 year	53	38	91	47	22	69
1-<,2 years	18	12	30	24	4	28
2-< 3 years	14	6	20	19	4	23
3- < 4 years	20	4	24	15	5	20
4- < 5 years	5	4	9	12	4	16
5 years or more	11	5	16	20	8	28
Total	121	69	190	137	47	184
	(63.68%)	(36.32%)	(100%)	(74.46%)	(25.54%)	(100%)

Post-operative complications occurring in the acceptors are shown in Table 6. Shoulder pain was the most common complication (48.7 per cent) followed by menstrual problems (37.0 per cent). Psychological disturbance following sterilization was not encountered in this study.

In the 374 cases followed up only 2 cases of failure (pregnancies) occurred subsequently. The failure rate was therefore 0.53 per cent. Both of them opted for MTP followed by tubal ligation through conventional approach.

Conclusion and Recommendations

The need for a male child, and the age of the acceptor seem to be major determinants of acceptance of this permanent method of family planning. Findings of other studies carried out reveals the same opinion¹⁰.

TABLE 6
POST- OPERATIVE COMPLICATION OBSERVED ON FOLLOW-UP

	Complication	No. of Cases	Percentage
1.	Shoulder pain	182	48.7%
2.	Menstrual problems*	138	36.9%
3.	Giddiness	61	16.3%
4.	Abdominal distension	61	16.3%
5.	Nausea	36	9.6%
6.	Vomiting	31	8.3%
7.	Backache	30	8.0%
	Bleeding from scar	23	6.1%
9.	Fever	22	5.9%
10.	Bowel problems	17	4.5%
11.	Others	11	2.9%
	Headache	5	
	Pain at site of operation	3	
	Allergic reactions and		
	local cellulitis	2	
	Urinary complaints	1	
12.	Failure (Pregnancies)	2	0.52%
13.	Nil (no problems)	115	30.7%

* Includes menorrhoea, oligomenorrhoea, irregular menses etc.

The method is very effective, with a failure rate of **0.53** per cent. Study shows that this time-saving and convenient method of tubal ligation is being accepted more readily by the under-privileged scheduled caste rural population. However, most of the acceptors are over **30** years old and are those producers who have already contributed about **4** children on an average to the population pool. The new technique therefore, though eliciting a bigger response in the form of more overall and particularly more under-privileged scheduled caste acceptors, still has not made much difference in the selection of cases. These services are still not making an appreciable impact in the group of fast producers and younger age-group, who are mainly responsible for the high birth-rate. This may be the reason why, inspite of a high effective family planning coverage obtained mainly through target-oriented sterilization coverage, there is no appreciable corresponding decline in the birth rate.

Family planning efforts can reduce birth rate only if the fast-producers and younger age-group are effectively covered. There is need for more research on ways and means of motivating these late acceptors and non-acceptors.

It is suggested that a permanent method of family planning has limited use in helping the younger age-group who are also the fast-producers. It would be perhaps more profitable to put more efforts into motivating this group to accept a reliable method of contraception other than sterilization, like IUCD or oral pills. Effective coverage of fast-producers and younger age-groups by means of contraceptive methods other than sterilization would be more acceptable to these target couples, and would have a bigger impact on reducing birth-rate than the present target-oriented blind emphasis on the permanent method of family planning.

Lkkjk'k

स्वीकार करने वाली महिलाओं की जनानकीय रूप रेखा और उनकी प्रजनन पद्धति का अध्ययन करने के लिए तथा आपरेशन के बाद होने वाली जटिलताओं, विशेषतः असफलता यदि कोई है का अध्ययन करने के लिए पंजाब के लुधियाना जिले के लुधियाना साहनेवाला ब्लॉक के विभिन्न केन्द्रों में परिवार नियोजन कैम्पों में फैलोप रिंग

द्वारा लैपरास्कोपिक तकनीक द्वारा स्वैच्छिक ट्यूबल लिगेशन के 347 मामलों को कम से कम छह माह से लेकर दो वर्ष की अवधि तक अनुपरीक्षण किया गया।

निष्कर्षों से पता चलता है कि इस सुविधा से लाभान्वित होने वालों में 50.8 प्रतिशत अनुसूचित जाति की महिलाएं थी और 655 प्रतिशत लाभार्थी 30 वर्ष से अधिक आयु की थी। अधिकांश महिलाओं और विशेषतः निम्नश्रेणी की अनुसूचित जातिय महिलाओं ने लैपरास्कोपिक ट्यूबल लिगेशन को चार या अधिक जीवित बच्चों के बाद अपनाया जिनमें दो अथवा अधिक पुरुष वर्ग के थे। महिलाओं ने सामान्यतः वन्ध्याकरण अंतिम लड़का होने के बारह माह के भीतर अपनाया। कंधों में दर्द तथा मासिक धर्म संबंधी शिकायतें आपरेशन के बाद सामान्य जटिलताएं थी जबकि असफलता दर 0.53 प्रतिशत थी। अध्ययन से आगे यह भी निष्कर्ष निकला कि यद्यपि लैपरास्कोपिक ट्यूबल लिगेशन वन्ध्याकरण का सुरक्षित कारगर व स्वीकार्य तरीका है जननांकिकीय रूपरेखा तथा स्वीकार करने वालों की प्रजनन पद्धति यह दर्शाती है कि इससे जन्म-दर को प्रभावित करने की अपेक्षा नहीं की जा सकती इसलिए सुझाव दिया जाता है कि वन्ध्याकरण के अतिरिक्त अन्य तरीकों को स्वीकार करने व लोकप्रिय बनाने के लिए भी कारगर प्रयास किये जाने चाहिए लक्ष्यानुकूल वन्ध्याकरण अभियान के स्थान पर विशेषतः युवा आयु-वर्ग में जन्म-दर घटाने का अधिक असर होगा।

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**A SOCIO-ECONOMIC STUDY OF JAPANESE ENCEPHALITIS IN
KOLAR DISTRICT OF KARNATAKA DURING 1981**

V.S. Badari

ABSTRACT

In this paper an attempt has been made to study the demographic and socio-economic characteristics of a sample of Japanese Encephalitis (JE) affected and non-affected households, with a view to exploring the factors associated with the disease - its contact and cure.

The study reveals that the incidence of J.E. was higher among males and among children. An inverse association was found between education of the head of the household and susceptibility of the household to the disease. Surprisingly, those with better economic status were relatively more affected by the disease. Those possessing domestic fowls were found to be more susceptible to the risk of contracting the disease.

The percentage cured was found to be higher for younger age groups and for male patients. It was also higher for those taken to the hospital soon after the attack. The percentage cured was positively associated with economic status and education of the head of the household.

Japanese encephalitis (J.E.) is an acute disease caused by Japanese encephalitis virus. It is popularly known as 'Brain fever', which created considerable anxiety among the people of Karnataka State, especially of Kolar district, in recent years. _

J.E. was first recognized in Japan as early as 1871; the first epidemic occurred in 1924¹. There was an outbreak of J.E. In 1955 around Vellore in North Arcot district of Tamil Nadu^{2,3}. In 1973 it occurred in an epidemic form in West Bengal, resulting in 839 cases with a case fatality rate of over 50 per cent⁴. In Karnataka there was a

localized outbreak of J.E. in 1977-78 in Kolar district. In 1978 there were several epidemics in different parts of India. In 1979 there was an epidemic in Karnataka State and Andhra Pradesh. During the epidemic 911 attacks were reported in Karnataka from 675 villages, out of which 226 deaths occurred. After a gap of one year, the epidemic again occurred in Karnataka in 1981 in the districts of Kolar, Tumkur, Mandya, Bangalore, Bellary, Belgaum, Mysore, Bijapur, Raichur, Chikkamagalur and Gulbarga; 837 attacks were reported during that year from 613 villages, out of which 236 deaths occurred. Kolar was the worst affected district, where 538 attacks from 389 villages were reported, out of which 133 (i.e. 25 per cent) deaths occurred. In view of the high incidence of the disease, Kolar district was chosen for the present study.

Pigs, birds like pond heron, bats, buffaloes and cattle are known to act as reservoirs of J.E. virus. It has been shown that, as in other countries, pig was the major host, especially in the epidemics in West Bengal^{5,6}. The migration of the wild birds which act as reservoirs of J.E. virus has been considered to be responsible for the spread of the infection. J.E. is transmitted by mosquitoes belonging to *Culex* Vishnu Complex, particularly *Culex tritaeniorhynchus* which breed mostly in rice fields⁷.

There is a close association between J.E. epidemics and prevalence of mosquitoes, which is closely related to rainfall and stagnant water. It may be of interest to note that the J.E. epidemics in Kolar district in 1979 and 1981 were preceded by heavy rainfall. (The rainfall in the years 1979, 1980 and 1981 was 904 Mms. 581 Mms. and 849 Mms. respectively, while the normal rainfall is 730 Mms.) Further, it may be noted that there are no perennial rivers in the district, but there are a number of tanks and ponds with stagnant water; this could be a contributing factor for the breeding of mosquitoes.

J.E. in man manifests dramatically with headache, fever, vomiting, convulsions and loss of consciousness. The illness may present with sudden onset of behavior changes in the form of irritability, restlessness and confusion, disorientation irrelevant talk, etc. Neck stiffness, speech disturbance and onset of paralysis are common features. Nearly one-third of the affected persons fully recover, another one-third is left with residual neurological deficit and the rest prove fatal. Case fatality rate varied from 25 to 45 per cent in various epidemics.

The main objective of this study was to analyse the demographic and socio-economic characteristics (including health practices) of the J.E. affected households and non-affected households, with a view to exploring the factors associated with the disease - its contact and cure. An attempt was also made to study the case histories of J.E. patients in this regard. The sample of J.E. patients for the study was drawn from those who were attacked by the disease during 1981 in Kolar District.

Data and Method

The data pertaining to the J.E. attacks by PHC in Kolar district during 1981 were obtained from the Directorate of Health and Family Welfare Services, Karnataka. The PHCs were classified into three distinct groups, *viz.*, those with high incidence of J.E. cases (Bagepalli, Batlahalli, Vokkaleri, Koorgepalli and Kaiwara), those with moderate incidence (Mulbagal, Sugatur, Kamasamudram, Siddlaghatta and Tondebavi) and those with low incidence (Malur, Guidbande, Dibbur, Namagondlu and Kyasamballi). From each group, 2 PHCs were selected at random. Thus six PHCs, *viz.*, Batlahalli, Kaiwara, Mulbagal, Sugatur, Dibbur and Kyasamballi, were selected. An attempt was made to contact all the affected households in these PHCs. But nearly 30 per cent of them could not be traced due to incomplete or incorrect address. Thus a total of 143 patients from 141 households were covered as shown in Table 1. Two of the households had two patients each. For

TABLE 1
J.E. PATIENTS STUDIED IN EACH SELECTED
P.H.C. IN KOLAR DISTRICT

Name of the PHC	Male	Female	Total
Batlahalli	29	22	51
Dibbur	3	4	7
Kaiwara	18	23	41
Kyasamballi	5	1	6
Mulbagal	12	3	15
Sugatur	15	8	23
Total	82	61	143

each of the J.E. affected households under study, a neighboring household with children, not affected by J.E. was also selected as control, for the purpose of comparison. This would enable us to study why some people who are exposed to the same environment are not affected by the disease.

Information relating to demographic and socio-economic characteristics, health practices, general awareness about the disease, precautions taken, etc., was collected from the selected J.E. affected households and non-affected households (control households) , by interviewing the head of the household, using a questionnaire. The field work was carried out in January 1982 by three Research Assistants under the supervision of a medical doctor, who recorded the case histories of the J.E. patients.

Comparison with control is essential; in order to know which of the categories is relatively more affected. For example, among the affected households, a majority may be of Hindus. From this, one cannot conclude that the Hindus are more susceptible to the disease. It may be that the general population is predominantly Hindu and therefore, more Hindus are affected. So, it would be appropriate to compare the proportion of Hindus of the affected households with the proportion of Hindus in the general population or among the control households selected, to know if the Hindus are relatively more affected. If the former proportion is significantly higher than the latter, it could be inferred that the Hindus are more susceptible to the disease. The ratio between the two proportions can serve as a useful index of susceptibility.

Thus, the *Susceptibility Index*, that is proposed here, indicates how susceptible (to the risk of contacting the disease) a particular category is, when compared to others. It is given by

$$S_i = \frac{a_i}{a} \frac{C}{C_i} \times 100$$

where S_i is the susceptibility index for the category 'i', $a^{\wedge}$ and $c^{\wedge}$ are the numbers of affected and control households respectively belonging to the category 'i', and a and c are

the total number of affected households and total number of control households respectively. In the present study, $a = c = 141$.

It may be noted that, when all the categories are equally susceptible, the value of the index will be 100 for each category.

Since, data pertaining to socio-economic characteristics of the general population (in the area of study) are not readily available, the data collected for the control households were used to compute the susceptibility index, although these households do not exactly represent the general population. The control households were not randomly chosen; the criterion for their selection was that they should be neighboring households to the affected households, as mentioned earlier.

Findings

The interview schedules were carefully edited. The data were coded and punched on cards and the tabulation was made using a sorter. The important findings of the study are listed as here under:

i. Age and Sex of the J.E. Patients

As mentioned earlier, in the 1981, J.E. epidemic in Kolar district, 538 persons were affected by the disease and 25 per cent of them died. The age - sex distribution of the patients are given in Table 2 shows that the incidence of the disease was higher among males than among females, the ratio being approximately 1.5: 1. The higher incidence among males was observed in other J.E. epidemics also. The table also shows that the incidence was very high nearly 90 per cent among children below 15 years of age; more than 50 per cent of the cases were among children of school-going age (6-14 years). Males in the age group 6-14 years were the worst affected group, accounting for one-third of the total number of attacks. In the West Bengal epidemic in 1973 the highest incidence was in the age group 10-19 years®.

The higher incidence of J.E. among male children, compared to adults, may be due to the lower resistance of the children and secondly because they are generally more exposed

TABLE 3
DISTRIBUTION OF J.E. PATIENTS IN KOLAR DISTRICT IN 1981 BY AGE AND SEX

Age (years)	Male	Female	Total
0- 5	115	81	196
6-14	173	95	268
15-44	15	27	42
45 and above	2	1	3
Age not recorded	5	4	9
Total	310	208	518

Source: Directorate of Health and Family Welfare Services, Karnataka

Note: Data on age and sex could not be obtained for 20 cases (out of 538) cases.

to mosquito bite, since they go to fields and are not adequately dressed. This again is in contrast to girls of the same age group (6-14 years) who are generally better dressed and are less exposed to mosquito bite.

ii. Religion/Caste

An important observation in the epidemics of West Bengal was the high incidence of the disease among the Scheduled Castes (S.C.) and Scheduled Tribes (S.T.), which are closely associated with rearing of pigs⁹. The present study has also revealed a higher incidence (though not significantly*) among them, as given in Table 3. The susceptibility index is highest (120) for the S.C. and S.T. group. But, pig rearing was not found to be common; only six affected and six control households were having pigs. It appears that people were -

*The lack of significant difference in the distributions of affected and control households in respect of religion/ caste may be due to the fact that those belonging to a particular religion/caste live in the same neighborhood, generally. It may be recalled that the affected and control households are neighboring households.

TABLE 3

DISTRIBUTION OF J.E. AFFECTED AND CONTROL HOUSEHOLDS UNDER
STUDY BY SOCIO-ECONOMIC CHARACTERISTICS

Characteristics			Affected House- holds	Control House- holds	Suscep- tibility Index S _i
Religion/ Caste	Vokkaliga		57	63	90
	S.C. and S.T		48	40	120
	Other Castes		33	34	97
	Muslims		3	4	75
	Total		141	141	100
Education of Head of the house- hold	Primary and below		104	68	153
	Above Primary		37	73	51
	Total		141	141	100
Economic 					

Note: (1) NK/NR = Not known/Not reported

(2) $S_i = \left[\frac{a_i}{a} \div \frac{c_i}{c} \right] \times 100$, where a_i and c_i are the numbers
of affected and control households respectively belonging
to the category 'i', $a = \sum a_i$ & $c = \sum c_i$ = Here $a = c = 141$.

cautioned against rearing of pigs after the previous epidemic of J.E. in the district.

iii. Education

Classifying the J.E. affected and control households under study according to education of the head of the household. It was found that those with primary education and below were relatively more among the affected households (104 out of 141) compared to the control households (68 out of 141). The proportions differ significantly; implying that the more educated the head of the household, the less susceptible is the household to the disease. The susceptibility index shows that those with primary education and below were three times as susceptible as others. The inverse association between education and susceptibility is to be expected, for educated persons are generally more aware about personal hygiene and preventive steps to be taken when an epidemic breaks out.

iv. Economic Status

Three indicators of economic status, viz., type of wall, cultivable land owned and per capita income, have been considered for this study. The affected and control households were classified according to each of the three indicators as given in Table 3. Surprisingly, all the classifications consistently show that those with better economic status were relatively more affected by the disease. Those with mud wall (representing 'low' economic status) were 95 out of 141 control households, whereas they were only 47 out of 141 affected households. Similarly, those with five acres of cultivable land or less and those with per capita income of less than Rs.1000 were relatively less affected. The susceptibility index reveals a positive association between economic status and susceptibility, consistently for each of the indicators.

v. Rearing of Animals and Fowls

As established earlier that households with better economic status were more susceptible to the attack of J.E. This is a surprising finding and needs to be examined further.

Rearing of some of the animals, especially pigs, has an influence on the spread of the disease. So it would be

relevant to study whether the animals reared by the affected households could have caused spreading of the disease.

Let us consider pigs first, as they are supposed to be the major carriers of the disease. It was surprising to find that only six J.E. affected households and six control households were rearing pigs. In fact, the pig population has been considerably reduced, especially after the previous epidemic in 1979. Pigs were rarely found in the villages. Out of 119 villages surveyed, some stray pigs were found only in 14 villages. So, it is unlikely that pigs were responsible for the spreading of the disease in the 1981 epidemic in Kolar district.

The distribution of the affected and control households according to rearing of different animals and fowls are given in Table 4. The table shows that 111 out of 141 affected households and 105 out of 141 control households were rearing cattle (cows, bulls, oxen and buffaloes). These proportions are not significantly different, and so, cattle may be ruled out as the main carriers of the disease in the Kolar epidemic.

The number of households having dogs was 53 out of 141 affected households and 42 out of 141 control households. Thus, it appears that those having dogs were more susceptible to the disease, but this could not be conclusively established, since the difference between the two proportions is not statistically significant.

It may be noted that 51 out of 141 affected households and 38 out of 141 control households were rearing sheep/goats as shown in Table 4. These proportions differ significantly, implying that sheep and goats could be carriers of the disease. It also shows that 60 out of 141 (i.e. 43 per cent) affected households were rearing fowls, whereas only eight out of 141 (i.e. 6 per cent) control households were having fowls. The difference between the two proportions is highly significant, implying that fowls also could be carriers of the disease.

If we take into account those households not having fowls (i.e. if we eliminate the effect of fowls), the effect of sheep/goats is not significant; the proportion rearing sheep/goats does not differ significantly for the two categories, viz. affected households 22 per cent and control

TABLE 4
DISTRIBUTION OF J.E. AFFECTED AND CONTROL HOUSEHOLDS UNDEI
STUDY ACCORDING TO REARING OF ANIMALS AND FOWLS

Affected Households				Control Households		
	Rearing	Not Rear- ing	Total	Rearing	Not Rear ing	Total
Pigs	6	135	141	6	135	141
Cattle	111	30	141	105	36	141
Sheep/Goats	51	90	141	38	103	141
Dogs	53	88	141	42	99	141
Fowls	60	81	141	8	133	141

Affected Households with No Fowls			Control Households with No Fowls		
Rearing Sheep/ Goats	Not Rear- ing Sheep/ Goats	Total	Rearing Sheep/ Goats	Not Rear- ing Sheep/ Goats	Total
18(22.2)	63(77.8)	81(100.0)	33(24.8)	100(75.2)	133(100.0)

Affected Households with No Sheep/Goats			Control Households with No Sheep/Goats		
Rearing Fowls	Not Rear- ing Fowls	Total	Rearing Fowls	Not Rear- ing Fowls	Total
27(30.0)	63(70.0)	90(100.0)	2(1.9)	101 (98.1)	103(100.0)

Note: The figures in brackets indicate percentages.

households 25 per cent. Now considering those households not having sheep/goats (i.e. eliminating the effect of sheep/ goats), the effect of fowls is still found to be significant; 30 per cent of the affected households were rearing fowls, compared to only 2 per cent of the control households.

Thus it appears that sheep and goats may be ruled out as the carriers of the disease. Further, the analysis shows that those having fowls were more susceptible to the disease. It is possible that fowls, like pigs, act as reservoirs of J.E. virus.

The distribution of the affected and control households by rearing of fowls and economic status (represented by type of wall) as shown in Table 4(a). The effect of rearing of fowls is significant for each category of economic status. That is, those having fowls were more susceptible, irrespective of their economic status. It may be noted that more than 40 per cent of the affected households belonging to each category of economic status were having fowls, compared to only 4-6 per cent of the control households.

Further, the proportion of affected households rearing fowls does not differ significantly for the two categories of economic status (40 per cent - mud wall, 44 per cent -brick/stone wall). Thus 'rearing of fowls' cannot explain why the higher economic status group was more susceptible.

It also reveals further that even in the absence of fowls; those with better economic status were more susceptible. Taking into account those households not rearing fowls, it may be noted that those with brick/stone wall (representing better economic status) accounted for 53 out of 81 (65 per cent) affected households and only 44 out of 133 (33 per cent) control households. These two proportions differ significantly.

It is possible that some of the households, particularly those belonging to higher economic status, might be affected by the presence of dogs, although they might not have fowls. This is examined in Table 4(b) which gives the distribution of the affected and control households with no fowls by presence of dogs and economic status (represented by type of wall). The table shows the effect of dogs when the effect of fowls is eliminated. It may be stated that, for each

Table 4 (a)
DISTRIBUTION OF J.E. AFFECTED AND CONTROL HOUSEHOLDS UNDER
STUDY BY REARING OF FOWLS AND ECONOMIC STATUS (TYPE OF
WALL)

Type of Wall	Affected Households			Control Households		
	Rearing Fowls	Not Rearing Fowls	Total	Rearing Fowls	Not Rearing Fowls	Total
Mud	19 (40.4)	28 (59.6)	47 (100.0)	6 (6.3)	89 (93.7)	95 (100.0)
Brick/ Stone	41 (43.6)	53 (56.4)	94 (100.0)	2 (4.3)	44 (95.7)	46 (100.0)
Total	60 (42.6)	81 (57.4)	141 (100.0)	8 (5.7)	133 (94.3)	141 (100.0)

The figures in Brackets indicate percentages

TABLE 4(b)
DISTRIBUTION OF AFFECTED AND CONTROL HOUSEHOLDS WITH NO
FOWLS BY PRESENCE OF DOGS AND ECONOMIC STATUS (TYPE OF WALL)

Type of Wall	Affected Households with No Fowls			Control Households with No Fowls		
	Having Dogs	Not Having Dogs	Total	Having Dogs	Not Having Dogs	Total
Mud	9 (32.1)	19 (67.9)	28 (100.0)	21 (23.6)	68 (76.4)	89 (100.0)
Brick/ Stone	17 (32.1)	36 (67.9)	53 (100.0)	13 (29.5)	31 (70.5)	44 (100.0)
Total	26 (32.1)	55 (67.9)	81 (100.0)	34 (25.6)	99 (74.4)	133 (100.0)

Note: The figures in brackets indicate percentages

category of economic status, those having dogs were relatively more affected, but not significantly so. In other words, the effect of dogs was not significant.

The proportion of affected households (with no fowls) having dogs is the same (32 per cent) for each category of economic status. Thus, the presence of dogs also cannot explain why those belonging to higher economic status were more susceptible.

It may also be noted from Table 4(b) that, even in the absence of dogs, the higher economic status group was more susceptible; those with brick/stone wall accounted for 36 out of 55 (65 per cent) affected households and only 31 out of 99 (31 per cent) control households. These two proportions differ significantly.

Findings further revealed that even in the absence of fowls and dogs, those with better economic status were more susceptible to the disease. It is possible that this group, which owns more land, makes frequent visits to the fields (where mosquitoes breed), have relatively more risk of contacting the disease.

vi. Awareness of the Disease

Most of the respondents could not state the cause of the disease. But when a leading question, 'Do you think that mosquitoes play a role in spreading brain fever?', was put, respondents of 42 per cent of the affected households and 55 per cent of the control households said 'Yes'. Similarly, 43 per cent of the affected households and 57 per cent of the control households were aware that pigs play a role in spreading J.E. Thus, the awareness was slightly higher (but not significantly) among the control households.

vii. Analysis of Case Histories

The case histories of the patients revealed that the attack started with fever in 71 (50 per cent) cases, headache in 47 (33 per cent) cases, vomiting in 9 (6 per cent) cases, convulsions in 7 (5 per cent) cases, earache in 4 (3 per cent) cases, giddiness in 4 (3 per cent) cases and neck stiffness in one case.

Out of 143 patients, 70 (49 per cent) got cured, 58 (41 per cent) expired and 15 (10 per cent) were disabled. Out of the 15 disabled, five had loss of speech, three had paralysis of all the limbs, five had paralysis of one or two limbs, one had mental retardation and one had deafness.

viii. *Characteristics of the 'Cured'*

Out of 143 J.E. patients under study, 70 (49 per cent) got cured, 58 expired and 15 were disabled. The percentage of patients cured for different age and sex categories is given in Table 5. The percentage cured for the 0-5 age group (66 per cent) is significantly higher than that for other age groups. The percentage cured is found to be higher for males (54 per cent) than for females (42 per cent) and significantly so for the 0-5 age group. This could be due to better treatment provided to male patients, as shown in Table 5(a). It may be seen from the table that 46 per cent of the male patients were taken to the hospital the same day or the next day after the attack, as against 34 per cent of the female patients. Although these percentages are not significantly different, they are indicative of the differential treatment received by the two categories. The earlier the patient is taken to the hospital, the better are the chances of recovery. This is reflected in Table 6 which gives percentage of J.E. patients cured according to day of visit to

TABLE 5
PERCENTAGE OF J.E. PATIENTS CURED FOR DIFFERENT AGE AND SEX CATEGORIES

Age (Years)	Male	Female	Total
0-5	80.0 (20)	50.0 (18)	65.8 (38)
6-14	44.4 (54)	42.1 (38)	43.5 (92)
15 +	57.1 (7)	16.7 (6)	38.5 (13)
Total	54.3 (81)	41.9 (62)	48.9 (143)

Note: 1. The figures in brackets give actual number attacked.
2. About 10 per cent of the patients were disabled, They were not included under 'cured'.

TABLE 5 (a)
DISTRIBUTION OF J.E. PATIENTS UNDER STUDY BY SEX AND DAY OF
VISIT TO HOSPITAL

Sex	The day when the patient was taken to hospital after attack		
	Same day or next day	After two days	Total
Male	37 (45.7)	44 (54.3)	81 (100.0)
Female	21 (33.9)	41 (66.1)	62 (100.0)
Total	56 (40.6)	85 (59.4)	143 (100.0)

Note: The figures in brackets give percentages.

TABLE 6
PERCENTAGE OF J.E. PATIENTS CURED ACCORDING TO DAY OF VISIT TO
HOSPITAL

The day when the patient was taken to hospital after attack	Number of Patients	Number Cured	Percentage Cured
Same day	33	19	57.6
Next day	25	13	52.0
Two days later	26	13	50.0
After 3 days	59	25	42.4
Total	143	70	48.9

hospital. It may also be observed from the table that the proportion cured, which is highest (58 per cent) for those taken to the hospital the same day of attack, gradually decreases to 42 per cent for those hospitalized after three days.

The percentage of J.E. patients cured for different categories of sex and religion/caste is given in Table 7. It may be observed that the percentage cured is significantly higher for Vokkaligas (62 per cent) than for SC/ST (42 per cent) and other castes (38 per cent).

The higher percentage cured for Vokkaligas may be due to their better economic status, as seen from Table 7(a), which gives the distribution of J.E. affected households by religion/ caste and land owned. It may be noted that nearly 50 per cent of the Vokkaliga households had more than five acres of cultivable land each, as against 20 per cent of other households. On an average, a Vokkaliga household owned 7.9 acres of cultivable land, as compared to 3.5 acres owned by others.

The percentage cured is positively associated with economic status can be inferred from Table 8, which gives percentage of patients cured by land owned. The table shows that the higher the land holding (representing economic status), the higher the percentage of cured. This is because those who are better off, economically, can afford to provide timely and proper medical attention to the patient.

The patient is likely to receive proper treatment in time if the head of the household is educated. For such patients, the chance of getting cured would be high. As expected, when the education of the head of the household is above Primary, the percentage of cured is significantly higher than when the education is Primary or below as given in Table 9.

Conclusions

In this paper an attempt has been made to study the demographic and socio-economic characteristics of a sample of J.E. (Japanese encephalitis) affected and non-affected households, with a view to exploring the factors associated with the disease - its contact and cure. The sample of J.E. patients was drawn from those who were attacked by the disease during 1981 in Kolar district of Karnataka State. Kolar was chosen

TABLE 7 (a)
PERCENTAGE OF J.E. PATIENTS CURED FOR DIFFERENT CATEGORIES OF
SEX AND RELIGION/CASTE

Religion/Caste	Male	Female	Total
Vokkaligas	65.8(38)	55.0(20)	62.1(58)
S.C./S.T.	52.2(23)	32.0(25)	41.7(48)
Other Castes	31.6(19)	46.7(15)	38.2(34)
Muslims	100.0(1)	0.0(2)	33.3(3)
Total	54.3(81)	41.9(62)	48.9(143)

Note: The figures in brackets give number attacked.

TABLE 7(a)
DISTRIBUTION OF J.E. AFFECTED HOUSEHOLDS BY RELIGION/CASTE AND
LAND OWNED

Religion/ Caste	Cultivable		Land Ownsd (Acres)			Total
	0	1-5	6-10	11-15	16+	
Vokkaligas	2	27	16	8	4	57
Others	12	55	14	2	1	84
Total	14	82	30	10	5	141

TABLE 8
PERCENTAGE OF J.E. PATIENTS CURED BY ECONOMIC STATUS (LAND OWNED)

Cultivable Land Owned (Acres)	Number Attacked	Number Cured	Percentage Cured
0	14	5	35.7
1- 5	82	39	47.6
6-10	32	15	46.9
11-15	10	6	60.0
16 and above	5	5	100.0
Total	143	70	48.9

TABLE 9
PERCENTAGE OF J.E. PATIENTS CURED ACCORDING TO EDUCATION OF THE HEAD OF THE HOUSEHOLD

Education of the Head of the Household	Number Attacked	Number Cured	Percentage Cured
Primary and below	105	46	43.8
Above Primary	38	24	63.2
Total	143	70	48.9

because of the high incidence of the disease in the district (538 attacks and 133 deaths during 1981).

In order to study which of the categories of households were relatively more affected by the disease, an index called 'Susceptibility Index' has been proposed.

The study reveals that the incidence of J.E. was higher among males than among females, the ratio being approximately 1.5: 1. Nearly 90 per cent of the J.E. patients were children below 15 years of age. The Scheduled Castes and Scheduled Tribes were more susceptible to the disease, compared to others. An inverse association was found between education of the head of the household and susceptibility of the household to the disease. Surprisingly, those with better economic status were relatively more affected by the disease. Those having fowls were found to be more susceptible to the risk of contacting the disease.

In most of the cases, the attack started with fever or headache, and in others, it started with vomiting or convulsions or earache or giddiness or neck stiffness.

Out of 143 J.E. patients under study, 70 got cured, 58 expired and the remaining 15 were disabled. Out of the 15 disabled, five had loss of speech and the others had paralysis of limbs or deafness or mental retardation.

The percentage cured was found to be higher for the younger age groups and for male patients. It was also higher for those taken to the hospital soon after the attack. It was found that the percentage cured was positively associated with economic status and also education of the head of the household. Among the various religion/caste categories, Vokkaligas (who enjoy better economic status than others) had the highest percentage of cured.

Policy Implications

1. A significant finding that emerges from the study is that fowls, like pigs, could be carriers of the encephalitis virus. Therefore, whenever there is an outbreak of J.E. epidemic, it is vital that fowls and pigs are isolated.
2. The study revealed that the chance of recovery would be higher if the patient is hospitalized earlier. So, the

people in the disease-prone areas should be educated about the importance of early hospitalization of suspected cases.

3. Steps to control mosquitoes should be intensified in the disease-prone areas during the risk period (September to December).
4. Research to develop an effective vaccine against J.E. should be promoted.

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Lkkjk'k

इस पेपर में जापानी एनसिफेलाइटिस बीमारी के फैलने व निदान से सम्बन्धित कारकों को खोजने के उद्देश्य से प्रभावित व गैर-प्रभावित घरों के जननांकिक व सामाजिक-आर्थिक लक्षणों का अध्ययन करने का प्रयास किया गया है।

इस अध्ययन से निष्कर्ष निकला है कि जापानी एनसिफेलाइटिस से प्रभावित होने वालों में पुरुषों व बच्चों की संख्या अधिक है। घर के प्रमुख की शिक्षा और बीमारी से उस परिवार के पीड़ित होने में एक प्रतिलोम सम्बन्ध पाया गया है। आश्चर्यजनक रूप से अच्छे आर्थिक स्तर के लोग अपेक्षाकृत अधिक रोगग्रस्त पाये गये। पालतू जानवर पालने वाले लोगों में भी रोगग्रस्त होने की संभावनाएं अधिक पाई गईं।

युवा आयु वर्ग और पुरुष रोगियों में बीमारी के निदान का प्रतिशत ऊंचा पाया गया। रोग का आक्रमण होने के तुरन्त बाद चिकित्सालय ले जाने वाले लोगों में भी यह ऊँचा था। निदान किए जाने वाले लोगों का प्रतिशत निश्चित रूप से आर्थिक स्तर और घर के प्रमुख की शिक्षा से सम्बद्ध था।

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**MEDICAL CARE EVALUATION (MEDICAL AUDIT) - A ESSENTIAL
INTERVENTION TO IMPROVE THE QUALITY OF PATIENT CARE
IN OUR HOSPITALS**

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ABSTRACT

This paper is based on the actual and pioneering research work on medical audit in this country during last ten years. Medical Audit and the Medical Care Evaluation are the synonyms. The authors have tried to convey that Medical Audit is eminently practicable and feasible. To start with internal Medical Audit, by peer-groups, is more likely to be effective than the external medical audit.

In our imperfect world self evaluation of any degree and of any value is improbable and therefore evaluation by audit and peer review is more likely to achieve its objectives. The difficulties inherent in medical audit are legion, but the objective is to evaluate the quality of medical care, to maintain the standards of excellence and if possible to improve these standards that fall below the accepted levels. It emphasizes the need for the continuing education of the hospitals' clinical staff as well as for orderly logical documentation of the findings within the clinical records, which is so very necessary for an useful exercise in medical audit. This paper vividly illustrates the tools and methods employed for a successful medical audit in a large teaching hospital of Delhi.

Introduction

Definition: Medical Care Evaluation or Medical Audit is defined as the evaluation of medical care in retrospect through analysis of medical records. It is a review of the professional work done in the hospital or in other words the quality of medical care rendered.

This paper is mainly based on the pioneering post-graduate (M.D.) thesis work of the authors titled 'Medical Audit and Patient Care in a Hospital'. It was carried out in Safdarjung Hospital in the year 1976-77.

The objectives of this study were as under:

1. to identify measures for adequate patient care practices in respect of a particular disease category;
2. to carry out medical audit of the same disease category of patients based upon a retrospective study of medical records; and
3. to develop norms of adequate medical care and test the feasibility of their implementation by the medical and other staff and to assess its impact on the quality of patient care.

In our country we have still not achieved a bed population ratio of one for 1000 population. This is in contrast to the recommendation of 2 to 4 beds per thousand populations made by the various famous committees starting from Bhore Committee (1946) to Jain Committee (1968). The bed population ratio continues to be around 0.6-0.8 bed per thousand populations. This may even decline further in the near future. This explains partially the phenomenon of over-crowding of our hospitals, particularly the State owned ones. The axe than falls on the quality of patient care which is adversely affected. There is, therefore, an immediate need to: (i) augment the bed complement in the country substantially. As of today a large majority of hospital beds are concentrated in the urban areas and any increase in it should be distributed rationally to provide more benefit to the rural areas, (ii) to improve the quality of patient care is to evaluate it i.e. to carry out periodically the medical audit of the in-patients of the hospital.

The methodology and the findings in brief of the study quoted along with those of a recent one (1984-85) are presented here to demonstrate the usefulness of such an exercise.

Tools and Methods

The study was conducted in Safdarjung Hospital, New

Delhi, which has a well developed medical records department. The Medical Records Officer was requested to give a list of the first ten disease categories for which the patients were admitted/discharged from the hospital, for the latest available year (1974). Typhoid fever which ranked at number nine position was chosen, as it was the only well defined single disease category.

In order to achieve the Objectives of the study, the following methods were adopted for collection of relevant information.

The study was conducted in two phases.

- (a) Retrospective Study (Audit Group) , and
- (b) Prospective Study (Re-audit Group).

A. *Retrospective Study*

The admissions for typhoid fever accounted for two per cent of the total 70,000 admissions during 1974 i.e. 1400 patients of typhoid/enteric fever.

The methodology of retrospective study included the following:

- i. *Development of Criteria Proforma*: This meant preparing a yardstick, in the form of criteria proforma for obtaining the required information from the medical records. It involves identification of measures for adequate patient care practices in respect of the said diagnosis. The variables chosen for evaluation were, history of fever, diagnosis agreement, a detailed account of patient's history, a detailed physical examination, laboratory investigations, antibiotic drugs ordered and their combinations, and data pertaining to length of stay and hospital services.

A detailed account of the technique of criteria development for medical audit has been published by the authors in the Official Journal of Indian Hospital Association, Hospital Administration, Vol. 18, No. 1 and 2, page 15-20, March-June, 1981 and titled as 'Criteria Construction in Medical Care Evaluation'.

- ii. *Review of the Criteria:* Review of the criteria proforma by a group of senior clinicians in the concerned speciality was done.
- iii. *Pretesting of Criteria Proforma:* Development and pretesting of criteria proforma satisfied the first objective of the study.
- iv. *Selection of Cases:* Selection of cases within diagnosis.
- v. *Sampling technique.*
- vi. *The Medical Audit Plan:* After developing and pretesting the criteria proforma, preparing the list of morbidity and mortality cases, and selecting a sample of 250 (including 48 deaths) cases, the actual medical auditing of these clinical records was undertaken.

The medical records were reviewed with regard to appropriateness of admission, history, physical examination, investigations, nursing services, complications and mortality. Records were also reviewed for the following:

- a. Completeness of the records.
- b. Diagnosis - Do the clinical findings support the final diagnosis.
- c. Treatment - Whether the treatment employed generally acceptable or open to question?
- d. End results - Whether the final result of the case and prognosis justifiable or not.
- e. Consultations, if any.

All the available information was transferred to the criteria proformae. Further, all the attached documents viz. TPR charts, laboratory reports, intake/out-put charts were also studied and recorded. The adverse observations and contradictions observed in the clinical records were noted at the end of the each criteria proforma.

Medical audit was thus carried out on 250 clinical records.

The raw data was processed and presented in tabular form (objective 2).

B. Prospective Study

This was carried out in the medical wards of Safdarjung Hospital. The methodology of prospective study included the following steps:

- i. *Development of Norms:* Based on the medical audit findings of the retrospective study, a check-list of items in the form of "norms of adequate medical care" (objective 3) was developed.
- ii. *Meeting with the Medical Staff:* Senior and responsible doctors including the senior residents of all the three medical units who attended the meeting were briefed on what a medical audit means and how useful it can be to them as an professional tool in improving the quality of patient care. This could be achieved by reviewing their own work and to find for themselves the errors, omissions and deficiencies as well as excesses in the care of patients under them.

Daily Plan of Study: The prospective study was conducted over a period of ten weeks and the daily activity used to be on the following points:

- a. Check one by one the admission registers of the three medical wards for any new suspected cases of typhoid/ enteric fever.
- b. Medical records of all the discharged cases of enteric fever were separated out.
- c. All the admissions of typhoid fever were followed right from the day of admission to the day of discharge. While attending to the individual patient, the following points were noted:
 - i. Complaint of the patient;
 - ii. Condition of the patient on examination;
 - iii. Noting of the doctors;

- iv. Any change or new therapy recommended;
- v. Any investigations recommended; and
- vi. Noting on nursing charts.

During the stay in the wards, besides above stated aspects the following points also need to be looked into:

- i. Round of the doctors;
- ii. Arrival of new typhoid fever cases in the wards;
- iii. Time of commencement of therapy to the new cases;
- iv. Time when samples for laboratory examinations were collected; and
- v. Time when reports were received from the laboratory.

The prospective study came to an end after observing 150 typhoid cases over a period of ten weeks.

The medical records of these 150 cases were retrieved from the Medical Records Department and the findings were transferred to the same but modified criteria proforma which was used in the retrospective study.

Impressions on the Retrospective Study

Many adverse observations that were noticed during the process of medical auditing are discussed as here under:

- a. There were eight cases in which the case history was either not written at all or was most incomplete.
- b. In ten cases though the relevant investigations were ordered by the physicians but were not carried out. It was observed that the majority of cases were treated on the basis of physicians' personal impressions without keeping any regard to the relevant and supporting investigations.
- c. Twenty eight cases were found to have received very poor care. In these cases, who remained admitted in

the wards for a period varying from five to fourteen days, no doctor recorded any progress notes on them, from the day of admission till discharge. Still four to six blank continuation sheets were found attached with many clinical records.

- d. In twenty clinical records the discharge time treatment with the anti-typhoid drugs was not mentioned at all.
- e. Nine patients were discharged in a febrile state.
- f. The coordination between the various hospital services particularly between the medical wards and the laboratory was found to be at low ebb. Many a times the patients were discharged without knowing the results of their blood cultures and the widal reactions. These reports used to reach medical wards after a delay of many days.
- g. Some of the contradictions within the clinical records, as highlighted were the most interesting findings of the retrospective study.

In one case the final summary read that the patient was put on capsule Chloromycetin, but there was no prescription to this effect anywhere in the clinical record, neither any charting was shown in the TPR charts.

- Similar discrepancy was noticed in another case, where the nurse's charts recorded that capsule Chloromycetin was given to the patient, but there was no such thing prescribed within the clinical record. In another instance a case that was put on capsule Chloromycetin, the discharge summary stated that the patient was given capsule Achromycin.
- A patient, who remained admitted for fourteen days as a suspected case of enteric fever, received no anti-typhoid drugs whatsoever.
- In another culture positive case, no anti-typhoid drugs were prescribed within the clinical record. However, capsule Chloromycetin were charted in the TPR charts.

- In another case the summary read that the patient was given injection chloromycetin, but there was no record of it either in the case sheet or TPR charts.
- Capsule Ampicillin were prescribed alone at the time of admission of a patient, but the summary stated that the patient was put on capsule Chloromycetin.
- Though no investigations were carried out in one case summary stated that the patient was fully investigated.
- A suspected case* of enteric fever who remained admitted for five days, no specific medication was done. The discharge summary stated that the patient left against medical advice (L.A.M.A.) before any investigations could be done. But all the necessary investigations including blood culture and widal test were carried out before the patient left the hospital. The reports of these investigations were found attached with the medical record.
- One patient who left against medical advice after running continuous temperature for seven days, the discharge summary was found to state that the patient was discharged in a good condition. Though within the clinical record he is shown to have gone L.A.M.A.
- The final diagnosis in one case was labeled as enteric fever, but the summary record mentioned the diagnosis as viral fever.
- In one case a contradicting laboratory finding was noticed. Two samples of blood of one patient were sent to a laboratory for enteric and pyogenic culture. When reports came in, one reported that the culture was negative for enteric group of organisms while the other reported the growth of Salmonella Typhoid.

From the discussion, it could be concluded that the management of typhoid patients, as reflected in the medical records was nowhere near the accepted standards of medical practice. Rather, it was most inappropriate. It appears that the doctors in most instances gave verbal orders to the nurses on the treatment and investigation.

Precisely, it can be said, "What the doctors carried out on the patients was not documented by them in the clinical records and what they documented was not carried out".

Impressions of the Prospective Study

As against the observations cited above, the findings of the prospective study have registered all round improvement in the management of typhoid fever cases. A few examples given here will uphold this view.

Laboratory Investigations: This is an important component in assessing the quality of care rendered to the enteric cases. A comparison of different investigations carried out in the retrospective and prospective phases of the study has been shown in Table 1.

The relevant investigations viz. blood culture and widal reaction were carried out in 84.0 per cent and 85.3 per cent cases respectively, as against the figures of 30.8 per cent and 47.6 per cent in the retrospective study. Same is the case with other investigations. However, the stool culture should have been done on 6.0 per cent prospective cases who stayed in the wards for over two weeks.

Evaluating patient care in the re-audit or prospective group on the whole, it was observed that in 94.3 per cent

TABLE 1

PERCENTAGE DISTRIBUTION OF RETROSPECTIVE (250) CASES AND PROSPECTIVE (150) CASES, ACCORDING TO THE VARIOUS LABORATORY INVESTIGATIONS PERFORMED

s. No.	Name of the Investigation	Retro spective cases		Prospective cases	
		Done	Not Done	Done	Not Done
1.	Blood culture	30.8	61.2	84.0	12.6
2.	Complete blood count	78.4	16.8	96.7	1.3
3.	Urine analysis	61.2	31.6	90.7	6.0
4.	Widal Reaction	47.6	42.0	85.3	2.7
5.	Peripheral blood smear	6.8	18.8	42.0	0.7
6.	X-ray chest	22.8	22.4	36.7	1.3
7.	Stool culture	-	-	-	6.0
8.	Follow-up laboratory studies	4.0	38.4	6.0	-

The not applicable responses are not included in the table.

cases the hospital services conformed to the essential principles (as per criteria proforma) of the management of typhoid fever.

In the audit or the retrospective group on the other hand, the patient care was adequate in only 67.6 per cent cases.

The concerted view that the medical audit is necessary to improve the quality of care as well as the utilization of hospital services has been again strengthened by M.D. thesis work². The broad features of the same research work are discussed hereunder:

Study of Caesarean cases was selected by her to be appropriate to assess the quality of maternity care, as there are numerous indications of the operations and thus evaluation of care given to these cases would also cover the assessment of management of high risk pregnancies. Another important aspect is that these cases stay in hospital for a much longer period as compared to a normal delivery case, thus representing a fair selection of obstetric care in terms of bed occupancy, cost and time spent. Incidentally, this research study too was carried out in Safdarjung Hospital in the year 1984-85. The tools and methods of this study were more or less the same as for the medical audit of typhoid cases *i.e.* a set of hundred randomly selected case records of Caesarean section (C.S.) performed in a previous year (1982) were reviewed against the criteria of minimal essential care for a C.S. case which were predeveloped in consultation with senior obstetricians. The results of the audit and the deficiencies observed along with checklist of minimal essential care for a C.S. case were presented to the team of doctors concerned with providing maternity care. Subsequently, case records of hundred C.S. cases performed after the introduction of criteria were reviewed (prospectively) on a similar pattern. This re-audit of 100 case records was used to measure change in physician compliance with medical care standards.

The aim of this study was the evaluation of the existing pattern of obstetric care of a large teaching hospital and to assess the impact and feasibility of system of medical audit on the quality of patient care.

Score Allocation: To minimize subjective bias a system of score allocation was followed. Relative weight age out of

100 was given to each of the major element. The scoring was also decided in consultation with the senior obstetricians and gynecologists. The Table 2 demonstrates the score allotment.

Since, criteria chosen were those elements of diagnosis and treatment which are essential to the proper care of every patient, achievement of at least 70 per cent of scores (weighted compliance) was thought to be necessary, as recommended by the above consultants.

The level of quality of maternity care provided in Safdarjung Hospital has been evaluated against the predeveloped criteria and standards. The difference in two groups has been assessed on the basis of compliance and results of the scores. After reviewing and scoring all the case records data of audit and reaudit group was analyzed. Data analysis was done under the following headings:

1. Process Assessment;
2. Outcome Assessment; and
3. Utilisation of Hospital Resources.

TABLE 2
MAJOR ELEMENTS OF PROCESS CARE, NUMBER OF ITEMS UNDER EACH AND THE RELATIVE SCORES ALLOTTED TO EACH OF THEM

s. No.	Major Process Element	No. of items included	Score allotted
1.	Face Sheet	5	5
2.	History	10	10
3.	Examination	20	15
4.	Investigations	8	10
5.	Preoperative Management	9	15
6.	Operation Records	10	10
7.	Anaesthesia Records	5	5
8.	New Born Records	5	5
9.	Nurses Records	5	5
10.	Post-operative Management	15	20
	Total	92	100

1. *Process Assessment:* This included the following:
 - a. *Diagnostic Process Evaluation:* Based on the compliance and scoring of history, examination and investigations.
 - b. *Therapeutic Process Evaluation:* Based on the compliance and scoring of preoperative, operative and post-operative management.
 - c. *Overall Adequacy of Maternity Services:* Based on total scores achieved on each case record.
2. *Outcome Assessment:* This included:
 - a. Disposition of patient i.e. died, routine discharge or L.A.M.A.
 - b. Maternal morbidity/postoperative complications.
 - c. Foetal outcome.
 - d. Justification for surgery.
 - e. Percentage of concomitant tubal ligations.
3. *Utilization of Hospital Resources:* This was assessed on the basis of:
 - a. *Average length of stay* - factors responsible for pro-longed stay before and after operation.
 - b. *Consultations:* indicated but not carried out.
 - c. *Special investigations* - indicated but not done.
 - d. *X-ray/U.S.G.* - indicated but not done.
 - e. *Blood transfusion* - indicated but not given.
 - f. *Antenatal coverage.*

The ultimate objective evaluation of maternity care of Safdaujung Hospital has been done against three checks and the grading of services has been done according to predeveloped adequacy scale.

Check 1: Under this, adequacy of maternity services was judged on the basis of total scores achieved on the case records.

Check 2: Under this, appropriateness of post-operative L.O.S. in C.S. was judged.

Check 3: Under this, it was judged whether indication of operation was justified or not.

Adequacy of Maternity Services

In the adequacy of maternity services study, assessment was made on the basis of total scores obtained on each case record. Seventy per cent scores have been considered adequate for minimal essential care. Grading of maternity care has been done on the basis of scores obtained. Results of overall scoring of case records (audit and re-audit) are shown in Table 3 and 4.

TABLE 3
DISTRIBUTION OF 100 AUDIT AND 100 REAUDIT CASES ACCORDING TO
PERCENTAGE OF TOTAL SCORES OBTAINED

Scale of scores (%)	Grade	Number Audit	of Cases (%) Reaudit
Less than 70	Poor	18	-
70 - 80	Fair	70	12
80 - 90	Good	12	69
90 - 100	Excellent	-	19
Total		100	100

TABLE 4
TOTAL SCORES ALLOCATED, MEAN AND RANGE OF TOTAL SCORES
OBTAINED AND PERCENTAGE OF CASES WITH ADEQUATE MATERNITY
SERVICES

Results		Audit	Reaudit
Total scores allocated		100	100
Mean score		74.4	85.7
Range of scores		60-85	74.5-95
Standard deviation		5.47	5.55
Percentage with adequate services		82	100
Mean weighted compliance (percentage)		74.4	85.7

The findings of this study proves that history, investigations and post-operative management which had poorer results in audit group have shown higher percentage increase in adequacy in re-audit group. Increase over audit group is 49.1 per cent, 65.95 per cent and 93 per cent respectively.

Adequacy of Hospital Services

The study shows that percentage of cases with overall adequate hospital services had increased to 100 per cent as against 82 per cent in audit group. Overall mean weighted compliance had increased to 85.7 per cent from 74.4 per cent.

All the same the study notes areas of persistently high non-compliance right from 'history writing' to post-operative management. Other studies identified the factors responsible for non-compliance². They are - ignorance, negligence, lack of knowledge and lack of importance attached to record keeping on part of junior doctors and lack of guidance, supervision, periodic reviews and appreciation on part of senior doctors. To summaries the results of audit (retrospective phase) and re-audit (prospective phase) show marked improvement in the maternity care but still there is scope for further improvement. Standards of adequacy can gradually be raised with an ultimate aim of 100 per cent compliance in these essential elements.

Conclusion

The more a doctor has the information about his own working methods and the outcome of his actions, the greater his self knowledge will be. The more opportunity he will have for identifying and remedying his own shortcomings. The benefit of this would be immense. Medical audit, when practiced can go a long way in improving the quality of patient care in our hospitals, which at present are far below the expectations of the community. Both these studies establish beyond doubt, that the system of medical audit is quite feasible in our hospitals. And it can definitely raise the standards of quality of inpatient care. It is mainly the motivation that is needed. Similar studies, if carried out in other departments of the hospital, will convince and encourage the clinicians to practice medical audit. This will also heighten their motivation towards its acceptance as a part and parcel of their responsibility. The results

have revealed better performance in the prospective/re-audit group indicating the significant and beneficial role of medical audit in medical care. The process can be repeated in a cyclical form aiming at higher standards every time. Ultimate aim should be 100 per cent compliance, because the 'criteria' chosen comprise of items of minimal essential care. As an educational experience, a good system of medical audit is worth any number of postgraduate courses. «

Lkkjk'k

यह पेपर देश में पिछले दस वर्षों के दौरान मेडिकल आडिट पर किए गये वास्तविक तथा अग्रणी शोध कार्य पर आधारित है। मेडिकल आडिट तथा चिकित्सकीय रक्षा मूल्यांकन एक दूसरे के पर्याय है। लेखकों ने यह स्पष्ट करने का प्रयत्न किया है कि मेडिकल आडिट पर्याप्त रूप से व्यवहारिक और उचित है। आरम्भिक रूप से व्यवहारिक मेडिकल आडिट पर्याप्त रूप में सम-वर्गों द्वारा किए जाने वाले आंतरिक मेडिकल आडिट के बाहरी मेडिकल आडिट की अपेक्षा अधिक प्रभावी होने की संभावनाएं होती हैं। इस अपूर्ण विश्व में किसी तरह व मूल्य का स्व0 मूल्यांकन असम्भाव्य है और इसीलिए आडिट व सम-समीक्षा द्वारा मूल्यांकन के उद्देश्यों की पूर्ति होना सम्भव लगता है। मेडिकल आडिट में होने वाली कठिनाइयां अपार हैं परन्तु इसका उद्देश्य चिकित्सकीय रक्षा की गुणवत्ता का मूल्यांकन करना व उत्कृष्टता के प्रतिमानों को बनाये रखना और यदि हो सके तो स्वीकार्य स्तर के नीचे गिरे हुए प्रतिमानों को बढ़ाना है। इसमें चिकित्सालयों के क्लिनिक स्टाफ की निरंतर शिक्षा की आवश्यकता व मेडिकल आडिट के लिए अत्यन्त जरूरी निष्कर्षों को क्रम बद्ध व तार्किक रूप से प्रालेखित किए जाने की आवश्यकता पर बल दिया जाता है। इस पेपर में दिल्ली के एक बड़े शैक्षणिक अस्पताल ने स्कूल मेडिकल आडिट के लिए प्रयुक्त करण और विधियों को जीवंत रूप से दशार्थ्य गया है।

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