High quality surgical care at low cost: the diagnostic camp model of Burrows Memorial Christian Hospital (BMCH)

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Abstract

Background The major problems that patients in rural areas face are related to accessibility, affordability and availability.

Aims of the study This study aims to evaluate how effectively the Diagnostic Camp Model of the institution meets the surgical needs of rural patients, by examining the logistics, economics and extent of the service provided.

Settings and design A retrospective study of patients attending the Diagnostic camps run by the staff of BMCH including the follow-up of these patients at the hospital.

Materials and method The diagnostic camps involve transporting medical personnel and modern diagnostic equipment into the interior villages of various North Eastern states of India. Patients requiring surgical intervention later attend the hospital for surgery with the assistance of a health insurance scheme.

Statistical analysis The local C3MDS computer software was used to obtain statistical reports from a diagnostic camp

held at Saiha, Mizoram. Previous hospital data and the Government of India census were used to estimate the number of men requiring surgical intervention for Benign Prostatic Hyperplasia (BPH).

Results About three quarters of surgical patients, who attended the surgical camp were unaware of their diagnosis prior to the camp. There was an overall profit despite the expected losses at the Hospital. These camps are a feasible and profitable venture on their own. About 50% of patients estimated to require surgical intervention for BPH in three districts of Mizoram received the necessary interventions.

Conclusion This model is an attractive, cost effective, efficient way of meeting the surgical needs of patients from a large geographical area.

Keywords Diagnostic camps · Surgical patients · Low cost surgery

Introduction

The major problems for patients in rural areas are related to *accessibility*, *affordability* and *availability*. Access to healthcare is difficult in rural North East India. In the Cachar district of Assam, where the hospital is located, over 41% of the population is below the poverty line and only 68% are literate. About 23% of the 1.4 million people in the Cachar District live in a flood prone area with an average of 3364 mm annual rainfall. In Tripura, road traffic travels in convoys with an armed escort due to political unrest and violence. Mizoram has over 75% forest cover and over 80% of the terrain is mountainous.

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Burrows Memorial Christian Hospital (BMCH) is a 70-bed charitable hospital based in Alipur, just 18 km away from Silchar in Assam, North East India. BMCH serves the poor and needy patients not only in Alipur but also from the neighboring states of Mizoram, Tripura, Meghalaya and Nagaland. BMCH has devised an innovative plan of diagnostic camps and health insurance to overcome the problems of Accessibility, Affordability and Availability. The logistics and economics of this model are described and a camp at Saiha in Mizoram is studied in detail.

This study was done to evaluate how effectively the Diagnostic Camp Model of the institution meets the surgical needs of rural patients, by examining the logistics, economics and extent of the service provided.

Method

The diagnostic camp involves taking medical personnel and modern diagnostic equipment into the interior villages of various North Eastern States of India. Patients requiring surgical intervention are then offered health insurance to subsidize the cost so they can attend the hospital where surgery can be performed at a discounted rate.

These camps are locally advertised by word of mouth by the local Churches, the Young Mizo's Associations or community leaders. They hear about these camps from patients, who visit the hospital or from other places where the camps are held. A wide geographical area of about 300 kilometers radius is covered by these camps and each location has a camp once in 6 months.

Official advertisement for the camps are carried out through local Church announcements, cable and radio networks, newspapers and announcements through the public address system attached to vehicles on the days of the camp. A nominal fee is charged to cover the advertisement expenses and the travel costs. This consultation fee varies from Rs 50 – 200, depending on location.

A team consisting of Doctors, Nurses, Pharmacists, Laboratory Technicians, Operating Room Technicians, Drivers and Administrative staff attend these camps with the entire pharmacy, laboratory with semiautomatic auto analysers, ultrasound, gastroscope, cystoscope, video system, computers, electricity generators, etc. Specialists and medical students from Christian Medical College, Vellore and abroad often join the team.

Patients identified with the need for surgical intervention are offered health insurance, which involves upfront payment of Rs. 1000 for enrollment. They are advised to come to the hospital for the surgical procedure, performed at a nominal cost of Rs. 500 for major surgeries such as laparoscopic cholecystectomies and Rs. 300 for minor surgical procedures. The patients do not pay any other charges at the hospital for the services. However they buy all the medicines and disposables at the hospital. Other conces-

sions are made for poor patients who cannot afford this insurance.

A detailed study of a diagnostic camp held at Saiha in Mizoram from May 16–23, 2006 was performed by medical students from Christian Medical College, Vellore and an elective medical student from Singapore. The retrospective data was analyzed from the Christian Comprehensive Computerised Mission Hospital Development Service (C3MDS) Hospital Management software installed at the hospital. We also reviewed the financial aspects of the camp and the relevant details showing the hospital statistics before and after the introduction of the diagnostic camps and health insurance to answer the following questions:

1. How did the patients find out about the camps?
2. a. What percentage of surgical patients are diagnosed for the first time in these camps?
b. If the patients already knew their diagnosis – where and when were they diagnosed?
c. Why had the patient delayed their surgery?
d. How much are patients willing to pay for the surgical treatment?
3. What losses does the hospital incur because of the camps?
4. Does the hospital benefit from the camps?
5. Has the health insurance scheme made any difference?
6. Can we estimate the proportion of the patients in an area with a given surgical condition have been successfully identified and treated under the health camp system?

The census figures were obtained from the Mizoram Government website. The estimates of men with bladder outflow obstruction requiring surgical intervention were calculated using prevalence data from the hospital community health villages.

Results

Patients came to know about the camps through a variety of means. (Fig. 1) Announcements made by the Church proved to be a useful means of communication especially in the Christian-majority State of Mizoram. Advertisements in local television network were popular and more effective than newspaper advertisements. Information spread by word of mouth through friends and from the hospital staff also contributed to a significant percentage of patients attending the camps.

At the Saiha camp 69 of the 240 patients examined had surgical conditions. Only 14 of these patients were aware of the surgical condition. In other words about 80% of the surgically treatable conditions were diagnosed for the first time during this camp.

Fig. 1

Fig. 2

Patients who were aware of their diagnosis had been aware of their condition for an average of 4.5 yrs. They reported several reasons for opting against surgical intervention (Table 2). Interestingly, financial constraints were not cited as a barrier to surgery. The reasons offered by patients generally reflected a lack of insight into their surgical condition and suggested that patient education would be an important area on which to focus. It is noteworthy that these patients were relatively well-off and the problems of affordability, accessibility and availability did not affect them to the same degree as the poor.

It is likely that such a small percentage of surgical patients had prior knowledge of their diagnosis because of the

high cost associated with attending a diagnostic procedure in a region where transportation and geographical terrain pose significant obstacles. Saiha has a government hospital that has diagnostic facilities but in reality, many are not functional and therefore not available. Table 3 lists the facilities for Saiha.

Of 43 surgical patients interviewed, 25% were willing to pay about Rs. 5000 for surgical procedures, 25% between Rs. 0 – 4000, and the other 50% were unwilling to commit a figure. (Fig. 2)

Financial analysis of the camp showed an overall profit despite the expected losses from a reduction in work at the hospital itself. Hence these camps are a feasible and profitable venture on their own, providing mutual benefit to both the hospital and the patients. In addition, the camp generates further income when the patients later attend the hospital for surgery. The sale of medicines and disposables gives a profit of about 50%. In the event of development of post-surgical complications, the hospital is not adversely affected from a financial viewpoint, as patients continue to purchase medicines and disposables and only the services are given free. If the patients are unable to afford medicines, the well stocked sample medicine pharmacy is used.

Table 4 gives the details of the bills of the last 7 patients. The increase in the number of operations performed at the hospital following the introduction of diagnostic camps and the health insurance scheme can be appreciated in Table 1. Despite the heavy discounts given to patients, the hospital profited around Rs. 3500 for every operation performed, largely as a result of profit margins from medicines and surgical disposables.

The ability of the diagnostic camp model to provide effective surgical coverage to an area was evaluated using the example of benign prostatic hypertrophy (BPH). Table 5 estimates the prevalence of BPH amongst men in three districts of Mizoram where Diagnostic camps have been held over the last 5 years. The number of patients from these areas undergoing transurethral vaporization of the prostate (TVP/TURP) at our hospital gives an estimate of our coverage for this condition.

Discussion

The challenge today is to bring first-world surgical care to rural patients [1, 2]. The strategy of conducting diagnostic

Table 1 Overview of camps and number of surgical patients at the hospital.

Year	Total no. of camps	No. of patients seen at camps	No. of patients from camp operated	Total No. of patients operated at BMCH
April 2003-March 2004	36	5560	58	1595
April 2004-March 2005	30	4715	82	2612
April 2005-March 2006	20	2691	318	3024

camps with the innovative health insurance scheme has been successfully implemented by Burrows Memorial Christian Hospital in various states of North East India. We studied this strategy from various perspectives, including the impact of the diagnostic camps, the financial aspect of the camps, the benefit of the camp to the hospital, and the response of the patients. We found that these diagnostic camps were in fact profitable to the hospital even after taking into account the losses incurred due to the absence of senior staff at the hospital. The camps are well received by patients, local medical personnel and government officers. More than three quarters of patients with surgically treatable conditions were diagnosed for the first time in these camps. The estimated coverage for treatment for benign prostatic hyperplasia is over 50%.

Although the study has the limitations of a retrospective study it has the advantage that all the data was available through the computer software. The over 50% coverage

for treatment for BPH might not be representative for other surgeries as it is a new, safe, effective, economic procedure with an uneventful recovery and the entire State of Mizoram does not have an Urologist [3].

The advantages of the diagnostic camp model become very obvious when we consider the available alternatives. To make urology operations possible in the 3 districts of Mizoram, the Government would have to employ many urologists and equip operating rooms capable of handling these operations. This would be much more expensive than our model which achieved 50% coverage without an urologist and urological surgical capabilities in these centres. The diagnostic facilities are also made available to the patients at a nominal cost. The number of patients diagnosed with surgical disorders increased almost four fold with this approach and would help in planning the actual needs of these communities.

The health insurance plan becomes feasible if the cost of the medicines and disposables are not included. Most of the patients do not complain about buying medicines and disposables and these are profitable in a well managed pharmacy.

The diagnostic camp model could be upgraded so that each district can have an ambulance service. This service could transport patients to the hospital following the camps. The services of specialists from reputed institutions such as CMC Vellore could be easily utilized in this model. Studies on coverage of other common elective surgical conditions would also be of benefit in future planning.

Conclusion

Surgical diagnostic camps and health insurance are an attractive, cost effective, efficient way of diagnosing the sur-

Table 2 Information about patients with prior surgical diagnosis (n=14).

Knew their diagnosis earlier	20.90%
Average time since diagnosis	4.5 years
Diagnosed at Saiha	55%
Diagnosed at Aizawl	33%
Self Diagnosis	12%
Did not know that surgery was required	33%
Could not decide about surgery	33%
Did not want surgery	22%
Felt that surgery was not important	12%

Table 3 Distance and cost for a procedure for a patient in saiha.

Procedure	Location	Distance	Procedure Cost	Total Cost
Gastroscopy	Aizawl	400 km	500 - 2000	3000-20000
Ultrasound	Aizawl/Lunglei	400/110 km	500 - 800	3000-20000
Cystoscopy	Aizawl	400 km	2000-8000	3000-20000
Special lab. Tests	Aizawl	400 km		3000-20000
ECG	Aizawl	400 km	150 - 300	3000-20000

Table 4 bills of last 7 health scheme patients.

Surgery	Total bill	Charity	Paid	Profit	Total profit
Composite resection	15,676	10,526	5,150	3,218	4,218
Lap. Cholecystectomy	13,123	7,403	5,720	3,920	4,920
Lap. Cholecystectomy	11,892	6,892	5,000	3,620	4,620
Lap. Cholecystectomy	10,175	6,675	3,500	1,280	2,280
LAVH	10,215	5,925	4,290	3,480	4,480
Hernioplasty	6,550	3,520	3,030	1,280	2,280
LAS	800	500	300	120	1,120
Average profit per person					3,417

Table 5 Estimates of coverage for transurethral vaporisation of prostate.

Men >50 in the three districts (Kolasib, Aizawl & Saiha)	47384
Estimated men with clinical BPH	2368
Cystometrogram (CMG) carried out	458
Requiring treatment	472
Underwent TVP/TURP	272
Estimate of coverage	58%

gical needs in a large geographical area. Burrows Memorial Christian Hospital will continue to refine its strategy and

upgrade the knowledge, skills and attitudes required to run successful surgical camps and offer compassionate christian care in North East India.

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