CLINICAL REVIEW
pISSN 0976 3325 | eISSN 2229 6816
Open Access Article
www.njcmindia.org

JAIPUR FOOT: AN ATTEMPT TO REPLICATE JAIPUR MODEL IN SURAT CITY

Hetavi Mahida[1], Dhiren Mahida[2]

Financial Support: None declared
Conflict of interest: None declared

Author's Affiliation: [1]Intern doctor, SMIMER, Surat; [2]Consultant Orthopaedic Surgeon, Surat

Correspondence:
Dr. Hetavi Mahida
E-mail: hetavimahida@gmail.com

Date of Submission: 04-03-15
Date of Acceptance: 20-06-15
Date of Publication: 30-06-15

ABSTRACT

The Jaipur limb has revolutionized the treatment of amputees in India costs only about $30 compared to a prosthetic foot in the U.S. costing $8,000. Jaipur limb is given away free to the many handicapped poor who have lost a limb. The attempt was made to replicate the model on a smaller scale without any financial help from others in a small private hospital in Surat is presented. The manufacturing process of the Jaipur foot, its advantages and drawbacks, its cost, the short coming in the project and possible reasons of inability to sustain the project is presented here.

Key words: Jaipur foot, Surat, Handicap

INTRODUCTION

Nationalal Sample Survey Organization estimated 1.8 percent disabled population in country. Every year 23,500 amputees are added to the amputee population in India. The elaborate artificial lower limbs developed in industrialized countries do not meet the needs of rural Indian amputees.

The Jaipur foot design was developed to meet the socio-cultural needs of handicapped people in India with their unique needs for a prosthetic that would permit them to squat, sit cross-legged, walk on uneven terrain, work in wet muddy fields, walk without shoes, and so on — it has proved to be a 'universal design' and can interface with prosthetic technology used around the globe. The Jaipur prosthesis, a type of exo-skeletal prosthesis which was originally made of aluminium, has a socket that is open on both ends. This makes it easier for the prosthesis to fit stumps of non-optimal size, common in Asian and Pacific developing countries.

The Jaipur foot was the brain child of a self taught craftsman Ram Chandra and Dr Pramod Kumar Sethi, Head of Dept of Orthopaedics, Sawai Man Singh College and Hospital, Jaipur and orthopaedic surgeons Dr S. C. Kasliwal and Dr. Mahesh Udawat.

The Surat Jaipur Foot Project: The project at Surat was started on a small scale aiming to replicate the success of the original Jaipur limb project. The project was started with an investment of Rs. 2.5 lakhs excluding the cost of the premises which were utilized free without any cost to the project. No funding or donation from any public or charitable organization was solicited or received. Some clubs like the Lions Club, sponsored individual cases.

The project was envisaged as one that would provide the limb free. After a year it was noticed

that many patients just shopped around for freebies and sometimes just did not come to take the prosthesis. So from the next year a token charge of Rs. 250/- ($4) was decided to be taken from the patients. This was again waived off in the poor. Many poignant, heart rendering and tragic cases were treated at the centre.

Publicity was minimal and word by mouth. The first four years saw a good number of prosthesis being manufactured yearly around 60 to 70. Thereafter an average of 40 limbs were made for the next 15 years. Gradually the numbers began declining in spite of there being no increase in cost or competition for the almost free service. An attempt is made to analyze the reasons as to why this centre could not reach the heights the centre in Jaipur could achieve.

DISCUSSION

Location: The BMVSS was attached to a public hospital whereas the Surat project was attached to a private hospital. The benefits of multiple doctors being attached to it and the good will of being attached to a welfare institute was lost. Private medical practitioners were reluctant to send patients fearing that they may lose their patient in spite of the fact that the amputee is an end stage case.

Publicity: Being a public private partnership initiative the BMVSS project received wide press coverage. The same could not be garnished for the Surat project as it was run by an individual.

Infrastructure and finances: The Surat project was handicapped by the lack of financial support to handle large volumes of cases. Same day delivery was not possible at Surat as skilled technician was called only once four or five moulds were ready to be fabricated. Though patients were allowed to stay at the hospital free of cost if required there was no permanent shelter and food arrangement like in Jaipur.

In spite of free services, investments in technological advancements could not be coped due lac of funding support.

Focus: The full focus of BMVSS was exclusively the amputees whereas the Surat Project focused on it as a social activity as a minor part of the hospital activity.

Skill: The Jaipur centre had 8 to 10 highly skilled technicians while the Surat centre had only one technician and that too on a part time basis.

Support to the Project: BMVSS was successful because of the untiring zeal and capability of Mr D R Mehta who could more the wheels in the bureaucracy, arrange for finance from corporates and other donors. Though the Surat project saw some help from a few clubs, it was episodic and not sustained over a period of time.

Quality: The low cost Jaipur below knee prosthesis has a very good acceptance rate of as high as 90% but the same cannot be said of the above knee prosthesis. The older versions especially the aluminum fixed lock versions were very heavy and cumbersome with a 70% rejection rate. Newer innovations and designs like the Stanford knee and other endoskeleton above knee prosthesis will probably increase the acceptance rate.

Innovation and technological advances: The opening up of the economy has seen the market been flooded with newer and more sophisticated prosthesis that are backed by technological leaders, well supported by a team of full time technicians, delivering better quality advanced prosthetics. Also the booming economy of Surat has seen the purchasing power of the people go up and they are willing to invest in better quality prosthetics that cost anywhere from Rs 15,000 to Rs 50,0000.

Extent of Service: The Jaipur project could cover a vast population and large geographical areas because of affiliation with public hospital and association of well-organized social groups. The same was not true for the Surat project. Help from clubs like the lions club was sporadic and erratic and not sustained. Every year a new president would come whose priorities were different and fund raising capacity questionable. The reach remained limited to Surat city and some tribal pockets in Surat district.

Quality of Prostheses: There has been very little real invention of or innovation in designs of prostheses in India. Except for the Jaipur foot and the work of BMVSS. The innovation has cut down on fabrication time greatly, and this in turn helps in keeping overhead low, and allows fitting of a much larger number of amputees.

There has been a great deal of debate regarding the biomechanical properties of the Jaipur foot, with many questioning its efficiency. However, according to tests done at the University of Strathclyde, the Jaipur foot compares favorably with the S.A.C.H. foot in most biomechanical aspects. There are minor variations in the two,

but the Strathclyde report claims that the patient in fact, preferred the Jaipur foot.

CONCLUSION AND RECOMMENDATIONS

In summary the replication of the Jaipur model is needed in all cities of India but the same cannot be sustained by an individual effort. If the same continues only a few amputees will be served. There has to be a drastic reordering of the priorities and accompanying changes in design of both prostheses and institutions if we desire to stop the backlog of amputees requiring prosthesis and bringing them back to a near normal life.

The design of the prosthesis should be able to fulfill the basic requirements of the amputee and also be versatile and adjustable to satisfy his specific individual needs. The Jaipur foot design should be carried forward and research and innovation carried out to remove the deficiencies and short coming in the foot. Efforts should be made to use engineers and technicians in associated industries to overcome the paucity of research in medical and rehabilitation institutes.

Design of centre should be cost effective and efficient considering the huge capital outlay involved. The centres should also be within easy reach of the poor and preferably be attached to public institutions like civil hospitals or public charitable trusts with good standing. Architecture of such centres should be patient friendly so that amputees have little difficulty in using them.

In conclusion projects like the Surat project for Jaipur limb should be revived after addressing their drawbacks if we desire a better world for amputees in India.

References:

1. Amputees in India ,Dinesh Mohan centre for Biomedical engineering ,IIT New Delhi NASEOH vol XIII no 4 oct 1983.
2. Duraiswami, P.K., "Rehabilitation and the State, in Proceedings National Seminar on Rehabilitation Services and Research, Vol. II., Medical College Trivandrum, India, 1967.
3. Sethi, P.K., Keynote Address, Asian Meeting on Childhood Disability, Family and Community Roles, UNICEF, New Delhi, November 2-5, 1981.
4. Narional Sample Survey Organization, Report on the Survey of Disabled Persons, 36th Round, July-December 1981, No. 305, Department of Statistics, New Delhi, 1983.
5. Padmanabha, P., Provisional Population Totals', Paper-1 of 1981, Series-1, India, Census of India, 1981.
6. Padmanabha, P., Provisional Population Totals Rural Urban Distribution, Paper-2 of 1981, Series-1, India, Census of India, 1981.
7. Babusenan, G., "Rehabilitation of the Disabled," in Proceedings National Seminar on Rehabilitation Services and Research, Vol. II, 38-42 Medical College, Trivandrum, India, 1967.
8. Natarajan, M., "The Problems of Rehabilitation of the Orthopaedically Handicapped," inProceedings National Seminar on Rehabilitation Services and Research, Vol. II, 45-47 Medical College, Trivandrum, India, 1967.
9. Sahasrabudhe, B.G., and Sancheti, K.H., "Survey of the Handicapped," Bulletin of Sancheti Hospital and Medical Research Centre, 1:2, 25-29 Pune, 1979.
10. Spencer, W.A., "Rehabilitation Concepts, Social and Economic Aspects of Assistive Devices," in Disability, Eds., R.M. Kenedi, J.P. Paul, and J. Hughes, 11-23 Macmillan Press, London, 1979.
11. Wilson, A.B. Jr., Limb Prosthetics, p. 7, Robert E. Krieger, Huntington, N.Y., 1972.
12. Chari, P.S., Kharshing, W., and Balakrishnan, C, "Wheat Thresher Hand Injuries," Indian Journal of Medical Research, 63:6, pp. 829-832, 1975.
13. Taylor, D.G., "The Economics of Rehabilitation," in Disability, Eds., R.M. Kenedi, J.P. Paul, and J. Hughes, pp. 87-100, Macmillan, London, 1979.
14. Mohan, D., "Statistical Jugglery by Railway," Indian Express 6, August 14, 1982.
15. Accident Statistics of Indian Railways for 1980-81 Ministry of Railways (Railway Board), Government of India, Delhi, 1982.
16. Establishment of a Limb Fitting Center: 300-360 Fitments In A Year, Project Report, Artificial Limbs Manufacturing Corporation of India, Kanpur, 1980.
17. Proceedings, National Seminar on Rehabilitation Services and Research, December 4-6, 1967, Medical College, Trivandrum, India.
18. Sethi, P.K., Udawat, M.P., Kasliwal, S.C. and Chandra, R., "Vulcanized Rubber Foot for Lower Limb Amputees," Prosthetics and Orthotics International, 2, pp. 125-136, 1978.
19. Sant, M.V., "Rehabilitation in Medicine," in Proceedings National Seminar on Rehabilitation Services and Research, pp. 15-24, Medical College, Trivandrum, India, 1967.