

Key Points to Improve Dialysis Facility at Government Tertiary Care Centre in Rajasthan, India



Medical Science

KEYWORDS : Dialysis, AKD facility, Dialyser, Immunisation, Management

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ABSTRACT

BACKGROUND AND OBJECTIVE:

Dialysis is a treatment for people in the later stage of chronic renal insufficiency (kidney failure), means "Cleaning the blood". Blood is circulated through a machine, which contains a dialyser (also called an artificial kidney). The wastes and excess water pass from the blood through the membrane into the dialysis fluid, which is then discarded. The cleaned blood is returned to the bloodstream. This paper was undertaken to address one of the major healthcare needs of Medical college Kota, that is, the lack of adequate Kidney Dialysis facility, which is a life support treatment for patients of renal failure. This forces many patients having to commute to private hospital for treatment. Dialysis unit requires a well planned strategy -Good planning, Good Design and construction, Good management. This study primarily deals with the planning aspects, assessing the need for the A.K.D. Centre & Conceptualization of the facility.

METHODS:A detailed market survey was carried out over a period of 5 to 6 weeks in 2011, in Medical college kota & Kota city, S.M.S.Medical College Jaipur, & R.N.T.Medical College Udaipur,Rajasthan, to get an overview of the dialysis facilities there.

CONCLUSION: Facility to reached out to maximum people we can manage all the problems by some efforts like : Awareness program's about preventable diseases & start early treatment of diseases harmful to kidney, Increase dialysis machine according to load, separate machine for HbsAg, HCV,HIV pt's, Increase staff & space according to load, Reduce wastage of time by timely deciding & timely cross reference, Usable items & dialysis fluids should be arranged in proper racks / place, All item, medicines & fluids should be free in govt. sector, Timely & freely vaccination reduce time & financial burden, Separate generator helps in uninterrupted dialysis, Require CMC of every machine.

INTRODUCTION:

This research paper was undertaken to address one of the major healthcare needs of Government Medical college Kota, Rajasthan, that is the lack of adequate Kidney Dialysis facility, which is a life support treatment for patients of renal failure. Government Medical College Kota has dialysis unit since 16.03.1999, There is increase no.of patients day by day due to endemicity of Falciparum malaria. However, some speciality and super speciality services are either lacking or inadequate in number to take care of the health needs of the growing population.This forces many patients having to commute to private hospital for treatment. Dialysis unit requires a well planned strategy -Good planning, Good Design and construction, Good management, This study primarily deals with the planning aspects, namely, Assessing the need for the A.K.D. Centre, Conceptualization of the facility.

METHODOLOGY:

A detailed market survey was carried out over a period of 5 to 6 weeks in 2011, in Medical college kota & Kota city, S.M.S.Medical College Jaipur, & R.N.T.Medical College Udaipur and a sample survey was also carried out in kota city Rajasthan, to get an overview of the dialysis facilities there.

Primary Data was collected by Personal Interviews (by prior appointments or as per convenience of the interviewee), Questions asked were based on a Questionnaire.

PRIMARY DATA COLLECTION: -

1. By personal interview - Number interviewed

- Consultant nephrologists/ urologist other specialities in Kota city - 6

- General Practitioners - 10

- Patients of AKD - 30

- Relatives of patient 15

By making personal visits to both public and private healthcare facilities in Kota city Raj.

SECONDARY DATA COLLECTION: -

Was done for contemporary social research, to identify - The migration pattern, medical facilities that are lacking, competition from existing hospitals.

The Sources of Secondary Data:- Government Medical college Kota health data, Internet, Hospital reports, Healthcare publications and brochures,Newspapers.

CRITICAL ANALYSIS & RESULTS

If the infrastructure facilities and long term plans of development in the area around is any indication, growth will continue for the next couple of decades, justifying the need for improvement in healthcare facilities, AKD being also part of it.

1. Government Medical College Kota is situated in heart of hadoti region, having increasing the chances of viability of project planned here.
2. The number of existing AKD machines are grossly inadequate to take care of the increasing load of renal failure patients.
3. Require better management to provide better facilities to dialysis patients.

Suggestion from interviewed Patients.

Interview of patient reveals that if services with all facilities under one roof should be provided at reasonable cost along with good patients transport ,with neighboring areas.

Criteria for choosing a hospital for AKD (according to most patients)

Safety, affordability, accessibility, travel time, confidence in doctor and hospital staff, comfort, reputation of set up, supportive facilities.

Suggestion from Interview of doctors and nephrologists

1. More AKD facility than what exists needs to be set up in Govt. Sector.
2. A lot of revenue loss and harassment of patient can be avoided if the cost of dialysis is reduced in Govt. sector & no.of machines increase so patients from here do not have to go in private and this save expenditure.
3. An AKD set up should look after the safety angle (stringent measures of checkup, immunisation, cleaning protocols, etc.)
4. Institutes must see that the cost of treatment is affordable to as many as possible.
5. Transportation provided by the hospital particularly post dialysis, at a nominal payment will contribute more towards patient care.

2.	Sudha Hospital, Talwandi, Kota	10 (Av.dialysis per month 500)	Takes maintenance dialysis patients / Infrastructure adequate
3.	Global Kota Heart Modi Hospital, Swami viveka nand nagar, Kota	6 (Av.dialysis per month 350)	Takes maintenance dialysis patients / Infrastructure adequate
4.	S.M.S.Medical College, Jaipur	5 (Av.dialysis per month 300)	Require proper Management Infrastructure inadequate
5.	R.N.T.Medical College, Udaipur	4 (Av.dialysis per month 240)	Require proper Management Infrastructure inadequate .

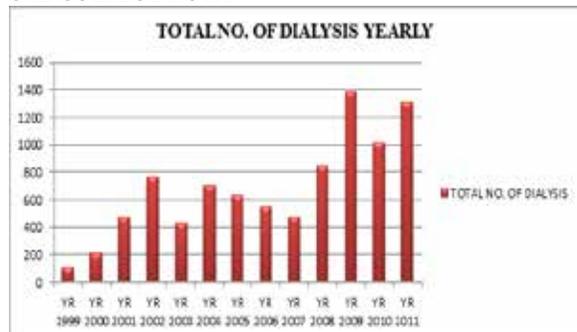
FINDINGS OF MARKET SURVEY

POPULATION OF KOTA

CENSUS GROUP	2001 CENSUS	2011 CENSUS
NMMC AREA		
Urban	838690	1007499
Village	729835	876598
TOTAL	1568525	1884097

From this table, it is evident that there is acute shortfall in AKD facilities Kota city in relation to population.

STATISTICS OF DIALYSIS IN GOVERNMENT MEDICAL COLLEGE KOTA



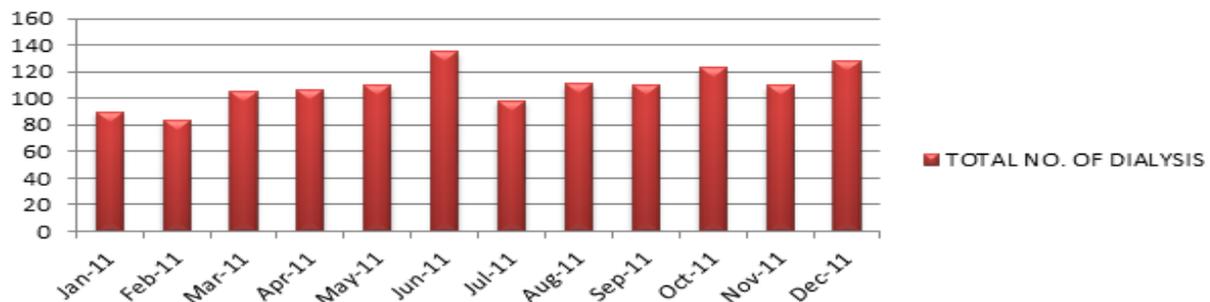
NUMBER OF DIALYSIS UNITS IN KOTA CITY & OTHER GOVT. MEDICAL COLLEGE

SR. NO.	LOCATION OF INSTITUTION	NO. OF DIALYSIS MACHINES	REMARKS
1.	Govt.Medical College Kota	3 (Av.dialysis per month 100)	Require proper Management Infrastructure inadequate

Total no.of dialysis yearly from 1999 to 2011 in Government medical college Kota,Rajasthan

TOTAL NO. OF DIALYSIS	110	212	472	769	431	700	633	551	474	849	1389	1017	1310
YEAR	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
	2 Machine (DEM,4008E)									3 Machines (DEM4008E + B.Braun)			3 Machines (B. Braun + Fresh ness)

TOTAL NO. OF DIALYSIS IN 2011



Total no. of dialysis in 2011 monthly by 3 machines(B.Braun + Freshness)

TOTAL NO. OF DIALYSIS	90	84	105	106	110	135	98	111	110	123	110	128	1310
MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL

DISCUSSION (Systems & Recommendations) -

1. As a routine unit runs 2 shifts i.e. 8:00 a.m. - 2:00 pm; 2:00 p.m. - 8:00 p.m.
2. Only patients seen and advised dialysis by consultant are taken up.
3. For dialyzing patients 3 machines in AKD is provided.
4. Dialysis In-charge is responsible for training, making duties of nursing staff and ensuring smooth functioning of department.
5. Renal profile done monthly.
6. HbsAg, HCV, HIV test is mandatory before a accepting new patient.
7. The existing Dialysis set up cannot meet the requirement because of lack of space for expansion.
8. Separate machine for Hepatitis B and C & HIV positive patients should be provided.
9. Wash rooms for dialyser and tubing should be two. Separate wash room is a must for positive patients.
10. Each wash area should have 2 washing sinks with multiple tapering taps. Wash should have provision of Pigeon and tubings which should ideally be of non corrosive material -wood or high grade stainless steel.
12. Patient waiting area - should be planned with 2 beds for holding a dialysis patient for a temporary period.
13. Post dialysis / Pre dialysis for observation and monitoring in case requirement. This will enable the dialysis bed to be free as soon as dialysis is terminated so that the next shift is not delayed, as well as IV catheter can be inserted in waiting room.
14. Central oxygen and suction should be provided.
15. Each machine should have ports for water inlet and drainage.
16. Quality of water is of prime importance for effective dialysis.
17. Pulse oxymeter should be provided with each patients.
18. Cardiac Monitor should be provided with each patients.
19. Require AMC of every machine.
20. Separate machine for HbsAg, HCV, HIV patients.
21. Air conditioning - The air conditioning is required for -Patient comfort, -optimal function of electronic panel of dialysis machine. Additional port for servicing of machine
22. Making of uniform bicarbonate solution should be catered. Nursing Station -should be strategically located for better observation.
23. Store should be large enough for holding a week supply of dialyser fluid etc.
24. Immunization of all staff against Hepatitis B is compulsory.

R.O. Plant (Reverse Osmosis Plant)

is a must, to deliver water of a particular standard and conductivity. The R.O. Plant should have automated system, with only the control panel (with lights) in the dialysis room.

Machine water should meet specification of National or European AAMI standards

- Conductivity should be below 1.0 ms/cm.
- Inlet pressure between 0.9 – 4.0 bar.
- Inlet temperature of water 50C to 320C
- Average water consumption 40 LPH (Litres/hr.)

RO removes following contaminants from water: chloride, calcium, nitrate, fluoride, arsenic, bacteria, virus, pyrogen, head, copper, mercury, magnesium, alum, alkali.

Conductivity ● ability of water sample to conduct electric current. As water improves its conductivity decreases because it has less amount of dissolved salts to conduct electric current.

Proposed systems

- Departmental manual with organogram, policies, protocols, procedures should be laid down. Individual job responsibilities should be laid down.
- Staff related system:- Safety, immunization, Rostering, Training should be well defined.
- Dos and Don'ts of the department should be clear and no ambiguity should be there.
- Policy of reuse of Dialyzers should be known to patient and clarified.
- Patient related system:-Immunization, Mandatory Blood tests and their frequency should be specified, Segregation of positive patients, HIV patient not dialyzed should be clarified.
- 2 shifts of 6 hours each on all week days and 1 shifts on Sunday.
- Shift timings (including cleaning and termination time)
 - 8:00 a.m. to 02:00 p.m. - Morning
 - 02:00 pm to 8:00 p.m. - Afternoon
- New patients will be admitted after mandatory blood tests (HIV, HCV, HbsAg, and Haemogram) and the first dialysis will be conducted under supervision of doctor.
- Appointments and scheduling of patients will be done by the Dialysis In-Charge. Patient's requests for change will be accommodated wherever possible.
- Periodicity of Tests HCV, HIV, HbsAg ● done every 3 months, Haemogram + Renal profile ● monthly Electrolytes.
- Separate enclosure for dialysis of positive patients with separate wash room for washing dialysis and tubing of positive patients.
- Reuse of dialyser and tubings - 5 to 6 reuse is done to save on costs however the option of using a fresh dialyser each time is with the patient.
- Immunisation of all staff against Hepatitis B is compulsory.
- In the absence of the In-Charge, the senior most nursing staff will be responsible for functioning of the unit.

SUMMARY & CONCLUSION

A detailed market survey was carried out over a period of 5 to 6 weeks, 2011 in Kota city & Government medical college kota, Global modi hospital swami vivekanand nagar kota, Sudha hospital talwandi kota, S.M.S.Medical College Jaipur, & R.N.T.Medical College Udaipur. I found that

- Increasing number of renal failure patients .
- Shortage of hemodialysis machines(only 3 machines available).
- Shortage of staff.
- Delaying starting in morning shift dialysis.
- No fix strategy for selecting patient of dialysis .
- Twenty four hour facility not available
- Shortage of space.
- Wastage of time between two consecutive dialysis.
- Mis-management in arrangement of items & drugs
- High cost for dialysis.
- Non-availability of proper place for usable items & dialysis fluids.
- Non availability of separate generator in dialysis department.
- Proper & timely vaccination.

In my opinion, for the facility to reached out to maximum people we can manage all the

- problems by some efforts like :-
- Awareness program's about preventable diseases & start early treatment of diseases harmful to kidney.
- Increase dialysis machine according to load, separate machine for HbsAg, HCV, HIV pt's.
- Increase staff & space according to load.
- Reduce wastage of time by timely deciding & timely cross reference.
- Usable items & dialysis fluids should be arranged in proper racks / place.
- All item , medicines & fluids should be free in govt. sector.
- Timely & freely vaccination reduce time & financial burden.
- Separate generator helps in uninterrupted dialysis.
- Require CMC of every machine.

Reference

1. National Kidney and Urologic Diseases Information Clearinghouse guidance Kidney Failure: Choosing a Treatment That's Right for You
2. Graham T. The Bakerian lecture: on osmotic force. *Philosophical Transactions of the Royal Society in London.* 1854;144:177-228.
3. Abel, J. J., Rountree, L. G., and Turner, B. B. The removal of diffusible substances from the circulating blood by means of dialysis. *Tn. Assoc. Am. Phys.*, 28:51, 1913.
4. Georg Haas (1886-1971): The Forgotten Hemodialysis Pioneer (PDF)
5. Kolff, W.J., and Berk, H. T. J. Artificial kidney, dialyzer with great area. *Geneesk. gids.*, 21:1944.
6. University of Lund website: Nils Alwall.
7. Shaldon S. Development of Hemodialysis, From Access to Machine (presentation given during a symposium entitled: Excellence in Dialysis: Update in Nephrology; Karachi, Pakistan. October, 2002, as archived on HDCN
8. Kjellstrand CM. History of Dialysis, Men and Ideas. Talk given to the Nordic Nephrology Days Symposium, Lund, 1997, as archived on HDCN.
9. Kishimoto TK, Viswanathan K, Ganguly T et al. (2008). "Contaminated heparin associated with adverse clinical events and activation of the contact system". *N Engl J Med* 358 (23): 2457-67. doi:10.1056/NEJ-Moa0803200. PMID 18434646.
10. Effects of short daily versus conventional hemodialysis on left ventricular hypertrophy and inflammatory markers: a prospective, controlled study ^ a b c d "Provisional Population Totals, Census of India 2011; Cities having population 1 lakh and above" (pdf). Office of the Registrar General & Census Commissioner, India. Retrieved 26 March 2012.
11. Falling Rain Genomics, Inc - Kota
12. a b Statistics by Govt. of Rajasthan
13. "Airports fail to lure airlines". *The Times of India.* 9 October 2011. Retrieved 4 February 2012.
14. Sources (Internet): www.biomedociety.com .
15. [dialysis / statistic.html](http://dialysis/statistic.html)
16. <http://www.esrds.org>
17. <http://www.kidney.org>
18. <http://www.unos.org>