

Improving Healthcare Quality for Patients Undergoing Hemodialysis by Analyzing Vascular Access Methods

Hsiu-Lan LI¹

Pei-Hui Tai¹

Shih-Wei Lin²

Yi-Ting Hwang³

(1)Department of Nursing, En Chu Kong Hospital, New Taipei City, Taiwan

(2)Department of Information Management College of Management, Chang Gung University, Taoyuan City, Taiwan

(3)Department of Statistics, National Taipei University, New Taipei City, Taiwan

Purpose:

Vascular access is the main access method for administering hemodialysis to patients. Hemodialysis quality is crucial for the health care quality of patients requiring such treatment. Complications related to hemodialysis access may reduce hemodialysis quality. With a view to maintaining patients' health care quality, this study analyzed data from the Taiwan Society of Nephrology: Kidney Dialysis, Transplantation (TSN KiDiT) registration system and investigated the steps involved in continuous quality improvement to understand the relationship between hemodialysis access types and health care quality and shed light on the various types of access through which patients currently receive hemodialysis.

Methods:

This study was conducted in a teaching hospital in Taiwan and involved a review of past data. Considering the sample size, this study selected only patients' hemodialysis treatment data from the TSN KiDiT that matched the study objective. This study was approved by the supervising unit and Institutional Review Board (ECKIRB1060801) and adhered to the ethical regulations and related laws of human research. All analyzed patients were at least 20 years old and were undergoing hemodialysis. Data on 1,909 patients recorded between January 2005 and December 2015 were analyzed. The statistical software SPSS 20.0 was used for analysis. Descriptive statistical analysis was conducted on the variables of the patients undergoing hemodialysis, including sex, age, duration of hemodialysis treatment, dialysis access, and diabetes mellitus history.

Results:

Among the 1,909 hemodialysis patients analyzed in this study, 921 (48.2%) were men. All patients were aged between 21 and 104 years (mean = 72.6 years). The patients had been receiving hemodialysis for an average of 8.6 years. A total of 294 patients (15.4%) used permcaths or other short- or long-term catheters, whereas the other 1,615 (84.6%) used artificial or autogenous arteriovenous or intravenous fistulas. A total of 1,030 patients (54.0%) had diabetes mellitus. The analysis yielded the following results: Patients undergoing hemodialysis and aged 65 years or older were especially worthy of attention. This group contained 1,356 patients, accounting for 71.0% of the sample, and were aged 80.0 years on average. Among them, 596 (44.0%) were men. The patients in this group had been receiving hemodialysis for an average of 8.0 years; 246 patients (18.1%) used permcaths or other short- or long-term catheters, whereas the other 1,110 (81.9%) used artificial or autogenous arteriovenous or intravenous fistulas. Among this group, 761 patients (56.1%) had diabetes mellitus.

Conclusion:

This study was conducted to help professional medical teams understand the implications of various groups of patients receiving hemodialysis through various types of access, thereby strengthening medical

professionals' understanding of health care quality in relation to hemodialysis quality and reducing the amount of medical treatment required and the frequency of infections and embolisms induced by dialysis access. The duration of hemodialysis treatment and dialysis access methods may be factors that directly contribute to access-related injury risk. In addition, these factors may indirectly result in negative outcomes such as stenosis, flow rate reduction, and infections or embolisms.

Applications in nursing: When offering nursing care, in addition to considering hemodialysis access types, nurses should consider patients' ages. Compared with patients of other age groups, those aged at least 65 years undergoing hemodialysis are more likely to encounter problems related to hemodialysis access. To maintain the function of vascular access and minimize the risk of complications caused by hemodialysis, medical team members must cooperate with one another and maintain frequent communication with patients and their caregivers to provide them with accurate information regarding taking care of vascular access. Nurses should focus on solving vascular access problems in the early stages of care for patients with terminal chronic kidney diseases. Nurses play a crucial role in maintaining unobstructed vascular access; therefore, ensuring continuous education for patients undergoing hemodialysis should not be neglected.

Title:

Improving Healthcare Quality for Patients Undergoing Hemodialysis by Analyzing Vascular Access Methods

Keywords:

Healthcare Quality, Hemodialysis Access Type Outcome and Hemodialysis Patients

References:

Bai, Y. L., Hung, S. Y., & Chiou, C. P. (2014). Vascular access management and education for hemodialysis patients. *The journal of Nursing*, 61(1), 93-98. doi:10.6224/JN.61.1.93

[Article in Chinese].

Ho, C.-C. (2013). The Assessment and nursing care of permanent vascular access in patients receiving hemodialysis *Journal of Taiwan Nephrology Nurses Association*, 12(1), 7-17.

[Article in Chinese].

Ravani, P., Palmer, S. C., Oliver, M. J., Quinn, R. R., MacRae, J. M., Tai, D. J., . . . Craig, J. C.

(2013). Associations between hemodialysis access type and clinical outcomes: a

systematic review. *Journal of the American Society of Nephrology*, 24 (3), 465-473.

Salman, L., & Beathard, G. (2013). Interventional nephrology: Physical examination as a tool

for surveillance for the hemodialysis arteriovenous access. *Clinical Journal of the American Society of Nephrology*, 8(7), 1220-1227.

van Loon, M. (2015). How to improve vascular access care. *In Patient Safety in Dialysis Access* (Vol. 184, pp. 222-233): Karger Publishers.

Abstract Summary:

Vascular access is the main access method for administering hemodialysis to patients. Hemodialysis quality is crucial for the health care quality of patients requiring such treatment. Complications related to hemodialysis access may reduce hemodialysis quality.

Content Outline:

Vascular access is the main access method for administering hemodialysis to patients. Hemodialysis quality is crucial for the health care quality of patients requiring such treatment. Complications related to hemodialysis access may reduce hemodialysis quality. With a view to maintaining patients' health care quality, this study analyzed data from the Taiwan Society of Nephrology: Kidney Dialysis, Transplantation (TSN KiDiT) registration system and investigated the steps involved in continuous quality improvement to understand the relationship between hemodialysis access types and health care quality and shed light on the various types of access through which patients currently receive hemodialysis.

First Primary Presenting Author

Primary Presenting Author

Hsiu-Lan LI
En Chu Kong Hospital
Department of Nursing
Head Nurse
Sanxia District
New Taipei City
Taiwan

Professional Experience: Academic background: 2015– now PhD – Chang Gung University (Taiwan) – Graduate Institute of Business and Management. 2011 – 2014 Master – Chang Gung University (Taiwan) – School of Business, Executive MBA Program in Information Management. 2007 – 2010 Bachelor – Chang Gung University of Science and Technology(Taiwan)–Department of Nursing. Work Experience: 12- 2011 to 9– 2015 Vice Head Nurse for Department of Nursing, En Chu Kong Hospital, Taiwan. 10- 2015 to now Head Nurse for Department of Nursing, En Chu Kong Hospital, Taiwan

Author Summary: HSIU-LAN Lin is a Head Nurse in Department of Nursing, En Chu Kong Hospital, Taiwan. He received his Nurse Baccalaureate. In Chang Gung University of Science and Technology of Nursing. His expertise interests Emergency nursing and Nurse management.

Second Secondary Presenting Author

Corresponding Secondary Presenting Author

Pei-Hui Tai
En Chu Kong Hospital
Department of Nursing
Head Nurse
Sanxia District
New Taipei City
Taiwan

Professional Experience: Academic background: 2007– 2009 Bachelor –Fu Jen Catholic University (Taiwan) – Department of Nursing. Work Experience: 12- 2011 to 9– 2015 Vice Head Nurse for Department of Nursing, En Chu Kong Hospital, Taiwan. 6-2007 to now Head Nurse for Department of Nursing, En Chu Kong Hospital, Taiwan

Author Summary: Pei-Hui Tai is a Head Nurse in Department of Nursing, En Chu Kong Hospital, Taiwan. He received his Nurse Baccalaureate. In Fu Jen Catholic University by the Department of Nursing. His expertise interests hemodialysis nursing and Nurse management.

Third Secondary Presenting Author

Corresponding Secondary Presenting Author

Shih-Wei Lin
Chang Gung University
Department of Information Management College of Management
Professor
Guishan Dist.
Taoyuan City
Taiwan

Professional Experience: Work Experience Associate Professor, Department of Information Management, Chang Gung University (August, 2008 - July, 2013), Taoyuan, Taiwan. Associate Professor, Department of Information Management, Huafan University (February, 2007 - July, 2008), New Taipei City, Taiwan. Assistant Professor, Department of Information Management, Huafan University (August, 2004 - January, 2007), New Taipei City, Taiwan. Assistant Professor, Department of Business Administration, China University of Technology (August, 2002 - July, 2004), Taipei City, Taiwan. Paid Service Experience 2010: National Science Council Proposal Reviewer, 3 Proposals Professional Memberships Chinese Institute of Industrial Engineers, 2009

Author Summary: Shih -Wei Lin is a Professor in Department of Information Management, Chang Gung University, Taiwan. He received his Ph.D. in Industrial Management from the National Taiwan University of Science and Technology in 2002. His current research interests include scheduling and data mining.

Fourth Secondary Presenting Author

Corresponding Secondary Presenting Author

Yi-Ting Hwang
National Taipei University
Department of Statistics
Professor
Sanxia Dist.
New Taipei City
Taiwan

Professional Experience: EDUCATION: •1999 Ph.D. Department of Mathematics, University of Maryland College of Computer Mathematical Physical Sciences, College Park, Maryland.

PROFESSIONAL EXPERIENCE: •2004-2011 Associate Professor. Department of Statistics, National Taipei University. •2001-2004 Assistant Professor. Department of Statistics, National Taipei University. •1999-2001 Research Instructor. Department of Human Oncology. Georgetown University School of Medicine. •1995-1999 Research Assistant. Statistics Laboratory. Academic Information Technology Service, University of Maryland.

Author Summary: Yi-Ting Hwang is a Professor in Department of Statistics, National Taipei University, Taiwan. He received his Ph.D. in Department of Mathematics, University of Maryland, College Park, USA.