Current Status of the Implication of the Clinical Practice Pattern in Hemodialysis Prescription in Regular Hemodialysis Patients in Egypt – Cairo - Sector (C)

Thesis

Submitted for partial fulfillment of Master Degree
in Internal Medicine

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2016


بسم الله الرحمن الرحيم
قَالُواْ سُبۡحَٰنَكَ لَا عِلۡمَ لَنَآ إِلَّا مَا
عَلَّمۡتَنَآۖ إِنَّكَ أَنتَ ٱلۡعَلِيمُ ٱلۡحَكِيمُ
صدق الله العظيم
البقرة
الآية
٣٢

*First and foremost thanks to **ALLAH**, the Most Merciful.*

I wish to express my deep appreciation and sincere gratitude to Prof. Dr. Khaled Hussein Abou-Seif, Professor of Internal Medicine and Nephrology, Faculty of Medicine – Ain Shams University, for his close supervision, valuable instructions, continuous help, patience, advices and guidance. he has generously devoted much of his time and effort for planning and supervision of this study. It was a great honor to me to work under his direct supervision.

I wish to express my great thanks and gratitude to Assist. Prof. Haitham Azzat Abd El-Aziz, Assistant Professor of Internal Medicine and Nephrology, Faculty of Medicine-Ain Shams University, for his kind supervision, indispensable advice and great help in this work.

Last and not least, I want to thank all my family, my fiancee, my colleagues,, for their valuable help and support.

Finally I would present all my appreciations to my patients without them, this work could not have been completed.

Abdallah Abdelkader Atia

List of Contents

List of Tables

List of Figures

LIST OF ABBREVIATIONS

Abbrev.	Full term
AV	Arteriovenous access
BFR	Blood flow rate
BMI	Body mass index
BP	Blood pressure
BUN	Blood Urea Nitrogen
CAPD	continuous ambulatory peritoneal dialysis
CAPR	Cardiopulmonary recirculation
CKD	Chronic kideny disease
CMS	US Centers for Medicare and Medicaid Services
CPG	clinical practice guidelines
CRP	C- reactive protein
CVC	Chronic venous cathter
CVD	Cardiovascular disease
DFR	Dialysate flow rate
DM	Diabetus mellitus
DOPPS	Dialysis outcome and practice pattern study
ERA-EDTA	The European Renal Association-European Dialysis and Transplantation association
ESRD	End stage renal disease
GFR	Glomerular filtration rate
GraDe	Grades of recommendation assessment, Development, and evaluation
HBV	Hepatitis B Virus
HCV	Hepatitis C Virus

LIST OF ABBREVIATIONS (Cont....)

Abbrev.	Full term
HD	Hemodialysis
HDF	Hemodiafiltration
HF	Hemofiltration
HTN	Hypertension
IPD	Intermittent peritoneal dialysis
K/DOQI	Kidney Disease Outcome Quality Initiative
KDIGO	Kidney disease improving global outcomes
KOA	The mass transfer area coefficient
MIA	Malnutrition -Inflammation atherosclerosis (MIA) Syndrome
MICS	'malnutrition–inflammation complex syndrome'
MOH	Ministry of health
NKF	National Kidney Foundation
PEM	Protein energy malnutrition
QIP	Qulaity improvement programs
RRT	Renal replacement therapy
SRI	Solute removal index
TMP	Transmembrane pressure
TNF α	Tumor necrosis factor
UF	Ultrafiltration
UKM	Urea kinetic modeling
UpostHD	Urea posthemodialysis
UpreHD	Urea prehemodialysis
URR	Urea reduction ratio
β2M	Beta 2 microglobulin
(K_{uf})	The ultrafiltration coefficient

Abstract

Introduction: Studies examining the link between research evidence and clinical practice have consistently shown gaps between the evidence and current practice . **Aim of the Work:** To study the pattern of current clinical practice in hemodialysis prescription in regular hemodialysis patients in Egypt and to compare this pattern with standard international guidelines in hemodialysis prescription, stressing on anemia, bone disease management and adequacy of dialysis. **Patients and methods:** A retrospective study was carried out including all 339 Patients. **Results:** of this study demonstrated that there were many causes for ESRD in the study population, where HTN 36.1%, DM 18%, and in 11.8% the cause was unknown, this results agrees with most of the studies where HTN & DM were the main causes of renal failure. **Conclusion:** The mean value of HD period is 4.7 (± 3.9) years. The mean value of patients dry weight was 70.7 (± 7) Kg. **Recommendations:** The developed practice guidelines should be reviewed and updated, if needed, yearly.

Key words: anemia, end-stage renal failure (ESRD),

INTRODUCTION

Studies examining the link between research evidence and clinical practice have consistently shown gaps between the evidence and current practice. Some studies in the United States suggest that 30%-40% of patients do not receive evidence-based care, while in 20% of patients care may be not needed or potentially harmful. However, relatively little information exists about how to apply evidence in clinical practice, and data on the effect of evidence-based guidelines on knowledge uptake, process of care or patient outcomes is limited ***(Locatelli et al., 2004).***

Appropriately then, the care of dialysis patients has been the prime focus of nephrology, particularly after the widespread availability of maintenance dialysis when it became evident that mortality of dialyzed patients was high and their quality of life far from adequate ***(Eknoyan et al., 2002).***

Guidelines practiced on anemia and actual practices are much different with different places and patients according to treatment. Moreover, in individual countries and individual units within countries local circumstances relating to economic conditions; organization of health care delivery or even legal constraints may render the immediate implementation of best practice guidelines difficult or impossible. Nevertheless, they

provide a goal against which progress can be measured. ***(Locatelli et al., 2004)***

Compliance with clinical guidelines is an important indicator of quality and efficacy of patient care, at the same time their adaptation in clinical practice may be initiated by numerous factors including; clinical experts, patient performance, constrains of public health policies, community standard, budgetary limitation and methods of feeding back information concerning current practice. ***(Cameron, 1999)***

End-stage renal disease (ESRD) is one of the main health problems in Egypt. Currently, hemodialysis represents the main mode for treatment of chronic kidney disease stage 5 (CKD5), previously called ESRD or chronic renal failure***.(Afifi, 1999)***

Although hemodialysis is often used for treatment of ESRD, no practice guidelines are available in Egypt. Healthcare facilities are seeking nowadays to develop practice guidelines for the sake of improving healthcare services***. (Ministry of Health and Population, 1999).***

AIM OF THE WORK

To study the pattern of current clinical practice in hemodialysis prescription in regular hemodialysis patients in Egypt and to compare this pattern with standard international guidelines in hemodialysis prescription, stressing on anemia, bone disease management and adequacy of dialysis.

HEMODIALYSIS PRESCRIPTION

Uremia is a quite complex syndrome encompassing a metabolic disorders and accumulation of various sized uremic toxins ***(Vanholder et al., 2003)***; that it would be impossible for intermittent renal replacement therapy (RRT) to replace the homeostatic role of the kidneys. Hence**,** the importance of providing at least adequate dialysis. **(*Eknoyan, 2005)***

Eradication of uremic symptoms was supposed to predict good long term results of dialysis-low morbidity and mortality. This approach of assessing adequacy is subjective, requires very careful monitoring of patients, and is time consuming ***(Twardowski, 2003).***

Hemodialysis (HD) therapy has been one of the true success stories in the annals of medical science. Before the availability of this treatment, the diagnosis of kidney failure was a death sentence ***(Butman and Nissenson, 2005).***

Unfortunately, despite major advances in the technology of HD and in the management of its complications, the morbidity and mortality of patients on dialysis remain high, at a time that the incidence and prevalence of kidney failure persistently are increasing. Hence, the early and continued concern with the adequacy of dialysis ***(Eknoyan, 2005).***

Optimal care of the patient receiving long-term HD requires broad knowledge of the HD technique and appropriate prescription according to patient- and device-dependent variables ***(Ikizler and Schulman, 2005)***.

Table (1): Elements of Hemodialysis Prescription.

Dialyzer
Time & frequency
Blood flow rate
Dialysate flow rate
Ultrafiltration rate
Dialysate composition
Anticoagulation

(Brenner and Rectors, 2008)

1-Dialyzers

Types of dialyers and its choice

The dialyzers are calssified either according to it's synthetic material into: cellulose, modified cellulose or synthetic polymers Or according to it's hydrokinetics into High-Flux &Low-Flux Dialyzers. All dialyzers in clinical use are of the hollow-fiber type with membranes of cellulose, modified cellulose or synthetic polymers. ***(Ronco and Clark, 2005).***

A biocompatible dialysis membrane is one in which minimal reaction occurs between the humoral and cellular components of blood as they come into contact with the surface of the dialyzer ***(Hakim, 1993)***.

Unsubstituted Cellulosic membranes have the propensity to activate the complement system. This activation of complement is partially responsible for the subsequent activation of neutrophils and other leukocytes, making these membranes bioincompatible ***(Chenoweth, 1984)***, whereas substituted cellulosic or synthetic membranes have more biocompatible characteristics.***(Ambalavanan et al., 1999)***

High-flux membranes have ultrafiltration coefficient

(K_{uf}) values > 12 mL/h/mm Hg, and as high as 80 mL/h/mm Hg. Low-flux membranes have K_{uf} values < 12 mL/h/mm Hg.The K_{uf} is calculated in milliliters of ultrafiltrate per hour per mm Hg (mL/h/mm Hg) of transmembrane pressure (TMP) ***(Chelamcharla et al., 2005)***

The efficiency and flux are not related to each other. Thus, high efficiency membranes can be either high flux (large surface area and large pores) or low flux (large surface area but small pores), and low efficiency membranes can also be either low flux or high flux ***(Ambalavanan et al., 1999)***.