Current Status of the Implication of the Clinical Practice Pattern in Hemodialysis Prescription in Regular Hemodialysis Patients in Egypt (NewVally)

Thesis

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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

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.

History Of Hemodialysis

Many have played a role in developing dialysis as a practical treatment for renal failure, starting with Thomas Graham of Glasgow, who first presented the principles of solute transport across a semipermeable membrane in 1854. **(Graham T. 1861)**

The artificial kidney was first developed by Abel, Rountree, and Turner in 1913. (**Abel JJ., et al 1913).**

the first hemodialysis in a human being was by Hass (February 28, 1924), and the artificial kidney was developed into a clinically useful apparatus by Kolff in 1943 - 1945.

Willem Kolff was the first to construct a working dialyzer in 1943. The first successfully treated patient was a 67-year-old woman in uremic coma who regained consciousness after 11 hours of hemodialysis with Kolff's dialyzer in 1945. At the time of its creation, Kolff's goal was to provide life support during recovery from acute renal failure. After World War II ended, Kolff donated the five dialyzers he had made to hospitals around the world, including Mount Sinai Hospital, New York. Kolff gave a set of blueprints for his hemodialysis machine to George Thorn at the Peter Bent Brigham Hospital in Boston. This led to the manufacture of the next generation of Kolff's dialyzer, a stainless steel Kolff-Brigham dialysis machine. **(Kolff, W. J., and Berk, H. T. J, 1944).**

According to McKellar (1999), a significant contribution to renal therapies was made by Canadian surgeon Gordon Murray with the assistance of two doctors, an undergraduate chemistry student, and research staff. Murray's work was conducted simultaneously and independently from that of Kolff. Murray's work led to the first successful artificial kidney built in North America in 1945–46, which was successfully used to treat a 26-year-old woman out of a uraemic coma in Toronto. The less-crude, more compact, second-generation "Murray-Roschlau" dialyser was invented in 1952–53, whose designs were stolen by German immigrant Erwin Halstrup, and passed off as his own (the "Halstrup–Baumann artificial kidney").

By the 1950s, Willem Kolff's invention of the dialyzer was used for acute renal failure, but it was not seen as a viable treatment for patients with stage 5 chronic kidney disease (CKD). At the time, doctors believed it was impossible for patients to have dialysis indefinitely for two reasons. First, they thought no man-made device could replace the function of kidneys over the long term. In addition, a patient undergoing dialysis suffered from damaged veins and arteries, so that after several treatments, it became difficult to find a vessel to access the patient's blood. **(McKellar, S,1999)**.

The original Kolff kidney was not very useful clinically, because it did not allow for removal of excess fluid. Swedish professor Nils Alwall encased a modified version of this kidney inside a stainless steel canister, to which a negative pressure could be applied, in this way effecting the first truly practical application of hemodialysis, which was done in 1946 at the University of Lund. Alwall also was arguably the inventor of the arteriovenous shunt for dialysis. He reported this first in 1948 where he used such an arteriovenous shunt in rabbits. Subsequently he used such shunts, made of glass, as well as his canister-enclosed dialyzer, to treat 1500 patients in renal failure between 1946 and 1960, as reported to the First International Congress of Nephrology held in Evian in September 1960. Alwall was appointed to a newly created Chair of Nephrology at the University of Lund in 1957. Subsequently, he collaborated with Swedish businessman Holger Crafoord to found one of the key companies that would manufacture dialysis equipment in the past 50 years, Gambro. The early history of dialysis has been reviewed by Stanley Shaldon **(Shaldon S. 2002)**.

Belding H. Scribner, working with the surgeon Wayne Quinton, modified the glass shunts used by Alwall by making them from Teflon. Another key improvement was to connect them to a short piece of silicone elastomer tubing. This formed the basis of the so-called Scribner shunt, perhaps more properly