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

Protocol of Thesis

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By

Sherif Mohamed Essam

M.B.B.CH. – Ain Shams University

Under Supervision of

Prof. Dr. Magdy Mohamed Saed Alsharkawy

Professor of Internal Medicine and Nephrology
Faculty of Medicine – Ain Shams University

Dr. Hesham Atef Abouellail

Assistant Professor of Internal Medicine and Nephrology
Faculty of Medicine – Ain Shams University

Dr. Aber Halim Baki

Assistant Professor of Internal Medicine and Nephrology
Faculty of Medicine – Ain Shams Universit

Faculty of Medicine
Ain Shams University
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List of Abbreviations

°C	Degree Celsius
ADPKD	Autosomal Dominant Polycystic Kidney Disease
AF	Atrial Fibrillation
AHA	American Heart Association
AVF	ArterioVenous Fistula
AVG	ArterioVenous Graft
BAP	Bone Alkaline Phosphatase
BMI	Body Mass Index
BP	Blood Pressure
Ca	Calcium
CAD	Coronary Artery Disease
CBC	Complete Blood Picture
CDC	Center for Disease Control
CHF	Congestive Heart Failure
CKD	Chronic Kidney Disease
CLD	Chronic Liver Disease
COPD	Chronic Obstructive Pulmonary Disease
CVCs	Central Venous Catheters
CVD	Cardio Vascular Disease
DM	Diabetes Mellitus
DOPPS	The Dialysis Outcomes and Practice Patterns Study
ECG	Electrocardiography
EDHS	Egyptian Demographic Health Survey

ESAs	**Erythropoietin Stimulating Agents**
ESRD	**End Stage Renal Disease**
GFR	**Glomerular Filtration Rate**
GN	**GlomeruluNephritis**
HBV	**Hepatitis B Virus**
HCV	**Hepatitis C Virus**
HD	**Hemodialysis**
Hgb	**Hemoglobin**
HIV	**Human Immunodeficiency Virus**
HMWH	**High Molecular Weight Heparin**
HTN	**Hypertension**
IBM	**International Business Machines**
ISHD	**Ischemic Heart Disease**
IV	**Intravenous**
K	**potassium**
KDIGO	***Kidney Disease Improving Global Outcomes***
KDOQI	***Kidney Disease Outcomes Quality Initiative***
KoA	**Mass transfer coefficient**
Low D Ca	**Low Dose Calcium**
MBD	**Mineral Bone Disease**
MCV	**Mean Corpuscular Volume**
MCV	**Mean Corpuscular Volume**

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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.1 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.

In recent years, specific clinical guidelines have been developed to optimize the quality of anemia management secondary to chronic kidney diseases(CKD).As a result, the National Kidney Foundation Kidney Disease Outcome Quality Initiative (K\DOQ I) guidelines and the Renal-European Dialysis and Transplantation Association best practice guidelines have been published in USA & Europe. Therefore; clinical practice guidance help individual physician and physicians as group to improve their clinical performance and thus raise standard of patient care towards optimum levels,

They may also help to insure that all institution provide an equally good base line standard of care ***(Cameron,1999).***

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).***

Dialysis Outcomes and Practice Patterns Study (DOPPS) has observed a large variation in anemia management among different countries. The main hemoglobin concentration in hemodialysis patient varied widely across the studied countries ranging between 8g/dl to 11g/dl. The percentage of prevalent hemodialysis patient receiving erythropoietin stimulating agent ’ESA’ has increased from 75% to 83%. The percentage of HD patient receiving iron varies greatly among DOPPS countries range from 38% to 89%, ***(Locatelli et al., 2004).***

There are challenges in implanting clinical guidelines in medical practice. Overall DOPPS data which show that, despite the availability of practice guidelines for treatment of renal anemia, wider variation in anemia management exists as gap between what is recommended by the guidelines and is accomplished in every day clinical practice. Compliance with clinical guidelines is an importance 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).***

AIM OF THE WORK

1. 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 (K/DIGO 2010), stressing on anemia, bone disease management and adequacy of dialysis.

2. Statement of the current status of dialysis patient in Egypt (questionnaire)

Hemodialysis

Hemodialysis (HD) is the process of removal of waste and excess fluid from the blood when this process cannot be done by the kidneys sufficiently. During the HD the blood is drawn intravenously from the patient, sent to a dialyzer and returned to the body through a blood vessel.

The goal of this process is to restore the normal balance between the extracellular and intracellular fluid environment, in addition to exchanging the solute either from the blood to the dialysate or vice versa.

The main components of the HD process are the extracorporeal blood circuit, the dialyzer, the dialysis machine and the water purification system. This process starts by delivering the blood from the vascular access to the extracorporeal system where two mechanisms are responsible for the flow of molecules, diffusion and ultra filtration. Diffusion refers to the movement of a solute across a semi permeable membrane according to the concentration gradient from higher concentration to lower concentration. It is

dependent on the physical size of the molecule relative to the size of the pores in the membrane. Ultra filtration refers to plasma water removal by applying a negative transmembrane pressure across the dialysis membrane. This hydrostatic pressure forces plasma water from the patient out into a dialysate. The blood circulated and diffused numerous times during a dialysis session; each circulation through the machine removes more waste and excess fluid.

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

Elements of Hemodialysis prescription:

1 Duration and frequency of sessions:

There is controversy regarding the length and frequency of HD treatment. As mentioned above it should be individualized according to each patient's need.

According to many studies done before, there are benefits for longer or more frequent sessions. Improved removal of

sequestered or protein bound solutes and acquiring optimal volume homeostasis are among those benefits **(Leypoldt, 2005)**. Also it allows better compliance on HD with fewer intradialytic complications such as: nausea, vomiting, cramping and hypotension. In addition better control of blood pressure with decreasing dosage of antihypertensive drugs, improving nutritional status, better quality of life and significant change in patients with hemodynamic or cardiovascular instability ***(Kurella and Chertow, 2005).***

The National Kidney Foundation recommended longer and more frequent dialysis for patients with volume overload and intradialytic hypotension preventing fluid removal **(National Kidney Foundation, 2006).** Increasing time of treatment helps to accomplish a body weight target among unstable patients with higher co morbidities **(Charra et al., 2003).** Poor phosphate control is an indication for increasing HD time and frequency as it provides better phosphate removal. Also large molecules such as beta 2-microglobulin clearance increases by increasing time ***(Leypoldt, 2005).***

However longer or more frequent dialysis is accompanied by some problems. Cost especially with consumption of more disposable materials is major problem.

Another one is the repeated punctures of the vascular access. Also there is noncompliance of the patients on longer or more frequent dialysis sessions.

2 Dialyzer type:

In general, the dialyzers are classified according to synthetic materials into: cellulose, modified cellulose or synthetic polymers. Another classification depends on the hydrokinetics: 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