

Causes, Complications and Pattern of Hemodialysis in Egypt (Alsharqia-A)

Thesis

Submitted for Partial Fulfillment of Master Degree
In Nephrology

By

NASSER SAID ALI SALEM

*Diploma of Internal Medicine
Ain shams University*

Under Supervision of

Prof. Dr. Tamer Wahid Elsaid

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

Dr. Mostafa Abdelnasier Abdulgawaad

*Lecturer of Internal Medicine and Nephrology.
Faculty of Medicine, Ain Shams University.*

Dr. Fatma Abdelrahman Ahmed

*Lecturer of Internal Medicine and Nephrology.
Faculty of Medicine, Ain Shams University.*

Faculty of Medicine - Ain Shams University

2019

Contents

	Page
List of Tables	III
List of Figures.....	VI
List of Abbreviations.....	VIII
1.1. Introduction.....	1
1.2. Aim of work.....	3
2. Review of literature	
2.1 Chronic Kidney Disease (CKD)	4
2-1-1 Risk factors for CKD.....	5
2-1-2 What causes CKD?	6
2-2 Hemodialysis.....	10
2-2-1 Home, nocturnal, and short-daily hemodialysis	11
2-2-2 Dialyzer	14
2-2-3 Treatment Time	15
2-2-4 Frequency of Dialysis	16
2-3 Metabolic Bone Disease in Chronic Kidney Disease	18
2-3-1 Pathogenesis of Metabolic Bone Disease in CKD	19
2-3-2 Hyperphosphatemia Treatment & Management	25
2-4 Anemia of chronic Renal Failure	30
2-4-1 Anemia Therapies	32
2-5 Hemodialysis in Egypt	47

3- Subject and Methods	50
4-Results	54
5-Discussion	89
6-Summary and Conclusion	96
7-Recommendations	99
8-References	101
Arabic Summary	

List of Tables

No		Page
Review of Literature		
1	Chronic kidney disease classification	5
2	Key Components of the Hemodialysis Prescription	13
3	Overview of currently available phosphate binders	27
Results		
1	Patients distribution in the study population	54
2	Gender distribution in the study population	55
3	Viral status in the study population	56
4	Different causes of ESRD in the study population	57
5	Duration of CKD	58
6	Different co-morbidities in the study population	59
7	Work status in the study population	61
8	Dependency status in the study population	62
9	Frequency of dialysis in the study population	63
10	Duration of HD session in the study population	64
11	Sponsoring status in the study population	66
12	Type of vascular access in the study population	67
13	Frequency of access failure in the study population	68

No		Page
14	Fistula failure number of failed access in the study population	69
15	Hemoglobin category in the study population	70
16	History of blood transfusion in the study population	71
17	ESA dose /week in the study population	72
18	Iron injection in the study population	73
19	History of vitamins use in the study population	74
20	Calcium category in the study population	76
21	Phosphorus category in the study population	77
22	Phosphate binder in the study population	78
23	Vitamin D dose iu/week in the study population	79
24	Types of complications during HD in the study population	80
25	Criteria of dialyzers in the study population	82
26	Criteria of dialysate in the study population	83
27	Dialysate potassium in the study population	84
28	Dialysate calcium in the study population	85
29	Calcium X phosphorus product during the former 6 months	86
30	HGB level during the former 6 months	86

No		Page
31	Dialysate Magnesium in the study population	87
32	Anticoagulation type used in the study population	88

List of Figures

No		Page
Review of Literature		
1	Diagrammatic representation of haemodialysis (HD)	10
2	Phosphate homoeostasis in humans	25
3	Comparison between ESRD prevalence worldwide	49
Results		
1	Gender distribution in the study population	55
2	Viral status in the study population	56
3	Different causes of ESRD in the study population	57
4	Duration of CKD	58
5	Different co-morbidities in the study population	59
6	Work status in the study population	61
7	Dependency status in the study population	62
8	HD session per week in the study population	63
9	Duration of HD session in the study population	64
10	Sponsoring status in the study population	66
11	Type of vascular access in the study population	67
12	Frequency of access failure in the study population	68

No		Page
13	Fistula failure number of failed access in the study population	69
14	Hemoglobin category in the study population	70
15	History of blood transfusion in the study population	71
16	ESA dose /week in the study population	72
17	Iron injection in the study population	73
18	History of vitamins use in the study population	74
19	Calcium category in the study population	76
20	Phosphorus category in the study population	77
21	Phosphate binder in the study population	78
22	Complications during HD session in the study population	80
23	Criteria of dialysate in the study population	83
24	Dialysate potassium in the study population	84
25	Dialysate calcium in the study population	85
26	Dialysate Magnesium in the study population	87
27	Anticoagulation type used in the study population	88

List of Abbreviations

ADHR	: Autosomal dominant hypophosphatemic rickets
BMP	: Bone morphogenetic protein
Calcium	: Ca
CAPD	: Continuous ambulatory peritoneal dialysis
CKD	: Chronic Kidney Disease
CRIC	: Renal Insufficiency Cohort
CRP	: C reactive protein
CVCs	: Central venous catheters
DM	: Diabetes mellitus
ECFV	: Extracellular fluid volume
EPO	: Erythropoietin
ESA	: Erythrocyte sedimentation rate
ESA	: Erythropoiesis-stimulating agents
ESRD	: End stage renal disease
ESRD	: End-stage renal disease
FGF23	: Fibroblast growth factor 23
GFR	: Glomerular filtration rate
HD	: Hemodialysis
HGB	: Hemoglobin
HIV	: Human immunodeficiency virus
HLA	: Human leukocytic antigen

HTN	: Hypertension
IL	: Interleukin
IPD	: Intermittent peritoneal dialysis
KDOQI	: Kidney Disease Outcomes Quality Initiative
KUf	: Ultrafiltration coefficient
MPD	: Metabolic bone disease
PAN	: Polyacrylonitrile
Phosphorus: P	
PMMA	: Polymethylmethacrylate
PTH	: Parathyroid hormone
RRT	: Renal replacement therapy
TNF	: Tumor necrosis factor
TNF	: Tumor necrosis factor
WHO	: World Health Organization

Abstract

Background: There is a gap between evidence base and current practice in hemodialysis pattern which is different from a country to another due to different economic levels and organization of health. These gaps include many things such as causes and co-morbidity modality of hemodialysis medication given.

Methods: This cross sectional study was carried out on 500 end Stage renal disease (ESRD) in Egypt

All patients selected will be subjected to full history, examination, medical record which includes iron study HGB, bone study, erythropoietin .vitamins, HD prescription, causes and complications of HD.

Conclusion: HD pattern in Egypt agrees with the international guidelines and other countries except age(less than USA), bicarbonate as buffer for HD (acetate still used) HGB level is 9.2 gm./dl(target 11-12), using sevelamer as phosphate binder less than usual percent of others, work status for HD pts., is higher than others, routine iron investigations and routine adequacy of HD

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. 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 (KDOQI) 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)