

**Current Status of the Implication of the
Clinical Practice Pattern in Hemodialysis
Prescription in Regular Hemodialysis
Patients in Egypt (Cairo) sector B3**

Thesis

Submitted for partial fulfillment of Master Degree
in Internal Medicine

By

Suzan Adel Mina

M.B.B.CH. – Ain Shams University

**Under Supervision of
Prof. Dr. Iman Ibraheem Sarhan**

Professor of Internal Medicine and Nephrology

Faculty of Medicine – Ain Shams University

Dr. Ahmed Shaban Serag El Deen Badawy

Lecturer of Internal Medicine and Nephrology

Faculty of Medicine – Ain Shams University

Faculty of medicine

Ain shams university

2014



*From all of my heart I want to thank **GOD** for being with me all the way , for never leaving me & for blessing me much more than I deserve.*

*I wish to express my deep appreciation and sincere gratitude to **Prof Dr. Iman Ibraheem Sarhan**, Professor of Internal Medicine and nephrology, Ain Shams University, for her close supervision, valuable instructions, continuous help, patience, advices and guidance. She has generously devoted much of her time and effort for planning and supervision of this study. It was a great honor to me to work under her direct supervision.*

*I wish to express my thanks and gratitude to **Dr. Ahmed Shaban Serag El Deen** lecturer of Internal Medicine and nephrology, Ain Shams University, for his kind supervision, advice and help in this work.*

*I wish to express my thanks and gratitude to **Dr. Yahya Makkeyah** Lecturer of Internal Medicine and nephrology, Ain Shams University, for his kind help and effort in this work.*

*I want to thank my beloved **family** and **my colleagues**, for their prayers, valuable help and support.*

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

Suzan Adel Mina

Contents

Subjects	Page
List of abbreviations.....	II
List of Figures	VI
List of Tables.....	VIII
• Introduction	1
• Aim of the work	4
• Review of Literature	
♦ Chapter (1): Hemodialysis in Egypt.....	5
♦ Chapter (2): Chronic Kidney Disease and its Complications	9
• Patients and Methods	54
• Results	59
• Discussion	87
• Summary and Conclusion	97
• Recommendations	103
• References	104
• Arabic Summary	

List of Abbreviations

Abbrev.	Full term
ACE- I	Angiotensin converting enzyme inhibitor
ACR	Albumin –creatinin ratio
ADPKD	Autosomal dominant polycystic kidney disease
AER	Albumin excretion rate
ARB	Angiotensin receptor blocker
AVF	Arteriovenous fistula
AVG	Arteriovenous graft
BMD	Bone mineral density
BMI	Body mass index
BP	Blood pressure
CBC	Complete blood count
CGN	Chronic glomerulonephritis
CPN	Chronic pyelonephritis
CKD	Chronic kidney disease
CHF	Congestive heart failure

List of Abbreviations

Abbrev.	Full term
CHOIR	Correction of Hemoglobin Outcomes in Renal Insufficiency
CLD	Chronic liver disease
COPD	Chronic obstructive lung disease
CRP	C-reactive protein
CVS	Cerebrovascular stroke
DM	Diabetes mellitus
DOPPS	Dialysis outcome and practice pattern study
Epo	Erythropoietin
ESA	Erythropoiesis stimulating agent
ESRD	End stage renal disease
eGFR	Estimated glomerular filtration rate
FDA	Food & drug administration
Gov	Government
HbA1c	Glycated Hemoglobin
HBsAg	Hepatitis B surface antigen
HCV	Hepatitis c virus
HD	Hemodialysis

Abbrev.	Full term
HDL	High density lipoprotein
Hgb	Hemoglobin
HOPE	Heart Outcomes Prevention Evaluation
HIV	Human immune deficiency virus
HMWH	High molecular weight heparin
HPT	Hyperparathyroidism
HTN	Hypertension
iPTH	Intact parathyroid hormone
ISHD	Ischemic heart disease
IV	Intravenous
K/DOQI	Kidney disease outcome quality initiative
KDIGO	Kidney disease improving global outcomes
LDL	Low density lipoprotein
LMWH	Low molecular weight heparin
LVH	Left ventricular hypertrophy
MBD	Mineral bone disease
MDRD	Modification of diet in renal disease study
MOH	Ministry of health

List of Abbreviations

Abbrev.	Full term
ND	Non dialysis
NICE	National institute of clinical excellence
PD	Peritoneal dialysis
PRCA	Pure red cell aplasia
PTH	Parathyroid hormone
PVD	Peripheral vascular disease
rHuEPO	Recombinant human erythropoietin
SD	Standard deviation
SGA	Subjective global assessment
SLE	Systemic lupus erythematosus
SPSS	Statistical package for special science
TIBC	Total iron binding capacity
TSAT	Transferrin saturation
URR	Urea reduction ratio
USA	United states of america
25(OH)D	25 hydroxy vitamin D (calcidiol)

List of Figures

<u>No.</u>	<u>Figure</u>	<u>Page</u>
<u>1</u>	CKD serious health complications.	43
<u>2</u>	Gender distribution in the study population.	59
<u>3</u>	Different causes of ESRD in the study population.	60
<u>4</u>	Different comorbidities in the study population.	61
<u>5</u>	Work status in the study population.	62
<u>6</u>	Dependency status in the study population.	63
<u>7</u>	Frequency of HD sessions/week in the study population.	64
<u>8</u>	Duration of HD session in the study population.	65
<u>9</u>	Sponsoring status in the study population.	66
<u>10</u>	Type of vascular access in the study population.	67
<u>11</u>	Frequency of access failure in the study population.	68
<u>12</u>	Hemoglobin category in the study population.	69
<u>13</u>	Ferritin levels in the study population.	70
<u>14</u>	TSAT Category in the study population.	71
<u>15</u>	History of blood transfusion in the study Population.	72
<u>16</u>	Different types of ESA used by the study population.	73

<u>No.</u>	<u>Figure</u>	<u>Page</u>
<u>17</u>	History of iron injection in the study population.	74
<u>18</u>	History of vitamins use in the study population.	75
<u>19</u>	Calcium levels in the study population.	76
<u>20</u>	Phosphorus level in the study population.	77
<u>21</u>	PTH levels in the study population.	78
<u>22</u>	Calcium phosphorus product level in the study population.	79
<u>23</u>	Types of phosphorus binders used by the study population.	80
<u>24</u>	Use of calcimimetics in study group.	81
<u>25</u>	Complications of HD in the study population.	82
<u>26</u>	Viral status in the study population.	83
<u>27</u>	The surface area of the used dialyzers in study group.	84
<u>28</u>	Type of used anticoagulant.	86

List of Tables

<u>No.</u>	<u>Table</u>	<u>Page</u>
<u>1</u>	GFR categories in CKD.	10
<u>2</u>	Albuminuria categories in CKD.	11
<u>3</u>	Gender distribution in the study population.	59
<u>4</u>	Different causes of ESRD in the study population.	60
<u>5</u>	Different comorbidities in the study population.	61
<u>6</u>	Work status in the study population.	62
<u>7</u>	Dependency status in the study population.	63
<u>8</u>	Frequency of HD sessions/week in the study population.	64
<u>9</u>	Duration of HD session in the study population.	65
<u>10</u>	Sponsoring status in the study population.	66
<u>11</u>	Type of vascular access in the study population.	67
<u>12</u>	Frequency of access failure in the study population.	68
<u>13</u>	Hemoglobin category in the study population.	69
<u>14</u>	Ferritin levels in the study population.	70
<u>15</u>	TSAT category in the study population.	71
<u>16</u>	History of blood transfusion in the study population.	72
<u>17</u>	Different types of ESA used by the study population.	73
<u>18</u>	History of iron injection in the study population.	74
<u>19</u>	History of vitamins use in the study population.	75
<u>20</u>	Calcium levels in the study population.	76

<u>No.</u>	<u>Table</u>	<u>Page</u>
<u>21</u>	Phosphorus level in the study population.	77
<u>22</u>	PTH levels in the study population.	78
<u>23</u>	Calcium phosphorus product level in the study population.	79
<u>24</u>	Types of phosphorus binders used by the study population.	80
<u>25</u>	Calcimimetic use in study populations.	81
<u>26</u>	Complications of HD in the study population.	82
<u>27</u>	Viral status in the study population.	83
<u>28</u>	Criteria of dialyzer used in the study population.	84
<u>29</u>	Criteria of dialysate used in the study population.	85
<u>30</u>	The type of used anticoagulant in the study group.	86

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 (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 what

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

To study the pattern of current clinical practice in hemodialysis prescription in regular hemodialysis patients in Cairo (sector B3) and to compare this pattern with standard international guidelines in hemodialysis prescription, stressing on anemia, bone disease management and adequacy of dialysis.