Relation Between Helicobacter Pylori And Iron Deficiency Anemia In Hemodialysis Patients

Thesis

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Abbreviations

ACG	American college of gastroenterology
BMI	Body mass index
CagA	Cytotoxin-Associated Antigen A
CKD	Chronic kidney disease
Co2	Carbon di oxide
C-RP	C reactive protein
DM	Diabetes mellitus
DU	Duodenal ulcer
EGF	Epidermal growth factor
ELISA	Enzyme-linked immunosorbent assay
ESAs	Erythropoietin stimulating agents
ESRD	End stage renal disease
GFR	Glomerular filtration rate
GIT	Gastro intestinal tract
H.pylori	Helicobacter pylori
Hb	Hemoglobin
HD	Hemodialysis
HTN	Hypertension
IARC	International Agency for Research on Cancer
IDA	Iron deficiency anemia
IFN	Interferon

Ig	Immuno globulin
IHD	Ischemic heart disease
IL	Inter leukin
KDOQI	Kidney Disease Outcome Quality Initiative
KDIGO	Kidney Disease: Improving Global Outcomes
LVH	Left ventricular hypertrophy
MALT	Mucosal associated lymphoid tissue
MHC	Major histo compatibility
mRNA	messenger Ribo nucleic acid
NSAIDs	Non-steroidal anti-inflammatory drugs
PPIs	Proton pump inhibitors
q.d.s.	quater die sumendus; four times a day.
RRT	Renal replacement therapy
TB	Tuberculosis
TH	T helper
TIBC	Total iron binding capacity
TNF	Tumour necrosis factor
TSAT	Transferrin saturation
UBT	Urea breathing test

Introduction

Anemia develops early in the course of chronic kidney disease (CKD) and is nearly universal in patients with end-stage renal disease (ESRD); anemia commonly contributes to poor quality of life in patients with CKD. Fortunately, among the disorders that may afflict patients with ESRD, anemia is the most responsive to treatment ***(Astor et al., 2002)***.

Anemia in patients with end-stage renal disease (ESRD) on hemodialysis (HD) is multifactorial, but mainly due to decreasing in red cell production (due to deficient erythropoietin synthesis) or iron deficiency, anemia should be evaluated in order to identify any reversible process, the most commonly encountered reversible cause of chronic anemia or worsening anemia in CKD patients, is iron deficiency ***(Mircescu et al., 2006)***.

It is important to detect causes of iron deficiency, one of these causes is repeated blood loss due to retention of blood in the dialyzer and blood lines, frequent blood sampling for laboratory testing, blood loss from surgical procedures (such as creation of vascular access), bleeding episodes or gastrointestinal blood loss ***(Kidney Disease: Improving Global Outcomes (KDIGO) Anemia Work Group, 2012)***.

Upper gastrointestinal abnormalities are common among HD patients even in the absence of symptoms, chronic active gastritis is the most common histological diagnosis among these patients and is highly associated with Helicobacter pylori infection ***(Al-Mueilo, 2004)***.

Helicobacter pylori (H.pylori) is a spiral, flagellated, gram-negative bacterium, specially adapted to survive in the gastric lumen ***(Calam, 1996)***, H.pylori infection affects more than 50% of the world population ***(Taylor and Blaser, 1991)***.

In the general population observational studies have shown a link between H. pylori and iron deficiency, often resulting in iron deficiency anemia. In randomized controlled trials, eradication of H. pylori can improve hemoglobin and serum ferritin levels but not significantly ***(Qu et al., 2010)***, In the general population, patients with iron-deficiency anemia, presence of H. pylori infection is associated with a poorer response to oral iron therapy, which improves with treatment for H. pylori infection ***(Valiyaveettil et al., 2005)***.

Despite the high prevalence of iron deficiency in hemodialysis patients, very little studies have been performed in this population to detect a relation between H. pylori and iron deficiency ***(Lopez et al., 2006)***.

According to reports, the prevalence of H.pylori infection is significantly lower in hemodialysis patients than in persons with normal renal function, and the prevalence is even reported to decrease with longer duration of hemodialysis. There are also previous reports presenting contrary findings ***(Suerbaum and Michetti, 2002)***.

Even if long-term dialysis patients have low prevalence of H. pylori, they still have significant gastro duodenal diseases ***(Sugimoto et al., 2009)***. There is no clear connection between inflammation and H. pylori infection in HD patients ***(Lentine et al., 2006)***.

Aim of the work

1. To assess the frequency of Helicobacter pylori infection in hemodialysis population.
2. To identify the possible relation between Helicobacter pylori infection and iron deficiency anemia in hemodialysis population.

Anemia in end stage renal disease

End stage renal disease (ESRD)

Chronic kidney disease (CKD) is a worldwide public health problem ***(Kidney Disease Outcome Quality Initiative, clinical practice guidelines for chronic kidney disease, 2002).***

Chronic kidney disease is a general term for heterogeneous disorders affecting the structure and function of the kidney. CKD needs a concerted public health approach for prevention, early detection, and management (***Levey et al., 2009).***

The definition of chronic kidney disease is based on presence of kidney damage or decreased kidney function for three or more months**,** irrespective of the cause**.** The disease is classified into six stages on the basis of GFR:

- G1 − GFR >90 mL/min per 1.73 m^2
- G2 − GFR 60 to 89 mL/min per 1.73 m^2
- G3a − GFR 45 to 59 mL/min per 1.73 m^2
- G3b − GFR 30 to 44 mL/min per 1.73 m^2
- G4 − GFR 15 to 29 mL/min per 1.73 m^2
- G5 − GFR <15 mL/min per 1.73 m^2 or treatment by dialysis

(Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group, 2012).

ESRD is the end result of Patients with CKD **(*Hsu et al., 2004);*** Incidence and prevalence vary because of differences in underlying diseases rates and availability of government-sponsored treatment. It is nearing 400 cases per million in the USA, Taiwan, and some regions in Mexico. Dialysis is the main treatment method in most countries. Diabetes is the main cause of kidney failure in most countries, accounting for 40% or more of new patients ***(Kepler, 2010).***

Prevalence seems to be increasing particularly in older individuals, and partly because of an increasing prevalence of diabetes and hypertension ***(Coresh et al., 2007).***

The rising prevalence of treated ESRD can be attributed to the increase in the number of patients who start renal replacement therapy (RRT) each year and to increased survival of patients with ESRD. Since the incidence rates of treated ESRD have flattened in recent years, longer lifespans of prevalent ESRD patients may partially explain the steady growth of this population ***(Kepler, 2010).***

ESRD are associated with high morbidity and increased health care utilization. Roughly fifty percent of dialysis patients have three or more comorbid conditions, the number of hospitalizations and hospital days are 1.9 and 12.8 per patient-year, respectively, and self-reported quality of life is far lower in

dialysis patients than in the general population ***(Deoreo, 1997).***

Patients with ESRD, are at increased risk of mortality, particularly from cardiovascular disease , Survival probabilities for dialysis patients at one, two, and five years are approximately 81, 65, and 34 percent, respectively ***(United States Renal Data System, 2009).***

Anemia develops early in the course of chronic kidney disease (CKD) and is nearly universal in patients with end-stage renal disease, and lead to increased morbidity and risk of mortality, particularly from cardiovascular disease ***(Astor et al., 2002).***

Anemia has also been implicated as a contributing factor in many of the symptoms associated with reduced kidney function. These include fatigue, depression, reduced exercise tolerance, dyspnea, and cardiovascular consequences, such as left ventricular hypertrophy (LVH) and left ventricular systolic dysfunction (***Levin et al., 1999).***

Anaemia in ESRD

Anemia develops early in the course of chronic kidney disease (CKD) and is nearly universal in patients with end-stage renal disease (ESRD); anemia commonly contributes to poor quality of life in patients with CKD. Fortunately, among the