

# **Vaccination Protocols in Chronic Kidney Disease**

Essay Submitted for partial fulfillment of the Master Degree in  
Internal Medicine

**By**

**Ahmed Mohamed Adel Yousseif**

M.B.B.Ch.

Ain Shams University

**Supervised by**

**Prof. Dr. Hany Ali Refaat**

Professor of Internal Medicine and Nephrology

Faculty of Medicine

Ain Shams University

**Dr. Heba Wahid El said**

Lecturer of Internal Medicine and Nephrology

Faculty of Medicine

Ain Shams University

Faculty of Medicine

Ain Shams University

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Ahmed Mohamed Adel

## List of Abbreviation

<b>ARF</b>	Acute renal failure
<b>ACEIs</b>	Angiotensin converting enzyme inhibitors
<b>ARBs</b>	Angiotensin receptors blockers
<b>AVF</b>	Arteriovenous fistula
<b>AVG</b>	Arteriovenous graft
<b>APCs</b>	Antigen presenting cell
<b>CRF</b>	Chronic renal failure
<b>CKD</b>	Chronic kidney disease
<b>CAPD</b>	Continuous ambulatory peritoneal dialysis
<b>CHF</b>	Congestive heart failure
<b>CMV</b>	Cytomegalovirus
<b>CAD</b>	Coronary artery disease
<b>Cr.CL</b>	Creatinine clearance
<b>ESRD</b>	End stage renal disease
<b>EBV</b>	Epstein Barr virus
<b>GFR</b>	Glomerular filtration rate
<b>GN</b>	Glomerulonephritis
<b>HBV</b>	Hepatitis B virus
<b>HCV</b>	Hepatitis C virus
<b>HIV</b>	Human immunodeficiency virus
<b>HEMO</b>	Hemodialysis
<b>HAART</b>	Highly active antiretroviral therapy
<b>HSV</b>	Herpes simplex virus
<b>LPSs</b>	Lipopolysaccharides
<b>MMR</b>	Measles , mumps , rubella

<b>NF-B</b>	Nuclear factor B
<b>PFU</b>	Plaque formation units
<b>PAMPs</b>	Pathogenic associated molecular pattern
<b>RRT</b>	Renal replacement therapy
<b>RBCs</b>	Red blood cells
<b>STD</b>	Sexually transmitted disease
<b>Th</b>	T helper lymphocytes
<b>TRL</b>	Toll like receptor
<b>UTI</b>	Urinary tract infection
<b>USRDS</b>	US renal data system

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## بروتوكولات التطعيمات في امراض الكلي المزمنة

### رسالة

توطئه للحصول علي درجة الماجستير في الباطنة العامة

#### مقدمة من

طبيب/ احمد محمد عادل يوسف  
ماجستير الطب و الجراحة

#### تحت اشراف

أ. د/ هاني علي رفعت  
استاذ الباطنة العامة و الكلي  
كلية الطب  
جامعة عين شمس

#### د/ هبة وحيد السعيد

مدرس الباطنة العامة و الكلي  
كلية الطب  
جامعة عين شمس

#### كلية الطب

جامعة عين شمس

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## الملخص العربي

تعد الأمراض المعدية أهم ثاني سبب من اسباب الوفيات في المرضى المصابين بأمراض الكلى المزمنة وخاصة مرضي الكلى على الاستصفاء الدموي المزمن

وذلك لأن المرضى المصابين بأمراض الكلى المزمنة يعانون من نقصن المناعة وخاصة في نشاط خلايا الجهاز المناعي مما يؤدي الى انخفاض سريع في مستوى الأجسام المضادة في هؤلاء المرضى مقارنة بالأصحاء .

ومن المعروف ان التطعيمات ضد الأمراض المعدية تستخدم بكثرة في الأصحاء عنه في المرضى المصابين بأمراض الكلى المزمنة وذلك خوفا من حدوث اعراض جانبية وايضاً الشك في فاعلية هذه التطعيمات في هؤلاء المرضى.

استخدام التطعيمات في المرضى المصابين بأمراض الكلى المزمنة قد يؤدي إلى وقايه كاملة ضد المرض مثل ( الأنفلونزا ) إلا ان بعض التطعيمات الأخرى قد لا تعطى الوقايه الكامله مثل ( الألتهاب الكبدى الوبائى ب ) وفي هذه الحالة قد يحتاج المريض إلى زيادة الجرعه أو اعطاء جرعات منشطة ولهذا يجب قياس معدل الأجسام المضادة بالدم لهؤلاء المرضى لمتابعة فاعلية هذه التطعيمات حيث انه لا يوجد ما يمنع من استخدام التطعيمات بل يجب تقنينها.

المعلومات عن استخدام التطعيمات في المرضى المصابين بأمراض الكلى المزمنة غالباً ماتكون محدودة ونحصل عليها عن طريق دراسة الأبحاث السابقه ولذلك استخدام التطعيمات في هؤلاء المرضى للوقايه من مضاعفات العدوى لاتزال محدودة و فقط دراسات محدودة قارنت بين تأثير التطعيمات على المرضى في مراحل الفشل الكلوى المختلفه ومرضى الكلى على الأستصفاء المزمن.

كما ان لاتوجد توصيات واضحه عن التطعيمات في مرضى زراعة الكلى والمعلومات المتاحة توجد فقط عن مصل ( الأنفلونزا) ويمكن اعطائة سنويا و مصل (الألتهاب الكبدي الوبائي ب ) الذي من الأفضل اعطائة قبل بداية الأستصفاء للوصول الي المستوي المطلوب من الأجسام المضادة للوقاية قبل اجراء عملية زراعة الكلى.

## **Introduction**

Infectious diseases are the second most common cause of death in end-stage renal disease (ESRD) patients . Patients with chronic kidney disease (CKD) are immunocompromised and hemodialysis (HD) patients are at high risk for several infections due to exposure to blood products ( **Janus , et al ,.2008**)

CKD patients present impaired cell-mediated and humoral Immunity, reducing activities of the immune system cells (B-cell, T-cell, monocytes, macrophages. . .) leading to a lower seroconversion rate, a lower peak of antibody titers and a quicker decline of antibody levels in these patients as compared with healthy subjects (**Van , et al ,.2001**)

Vaccination against the most common pathogenic agents is widely used among the healthy immunocompetent population. However it is less common in patients with renal disease because of the risk of side effects and doubts as to their efficacy in this population ( **Janus , et al ,.2008**)

Vaccination of ESRD patients is, in general, well tolerated at standard doses or higher doses. Some vaccines may induce a high-enough seroconversion rates to confer protection against the disease (like influenza). However, other vaccines sometimes do not provide protection against the pathogenic agents (like HBV). In these cases, higher and/or supplemental booster doses are

the more common solutions to reinforce immunity of the ESRD patients. Antibody levels must thus be monitored in order to assess the protective effects of the vaccines. Appropriate immunization of ESRD patients is essential and vaccination should not be avoided but adapted (**kara , et al ,.2004**)

The kidney disease outcomes quality initiative (KDOQI) provides evidence based clinical practice guidelines for different aspects of management of patients at all stages of CKD however no guidelines are available yet for preventive care in patients with CKD, including the use of vaccines. Data about immunization of patients with renal disease are limited and obtained predominantly from retrospective studies. There are few studies comparing immunization outcomes in patients at different stages of CKD or patients on dialysis (**Dinitis, et al ,.2004**)

Although there are no clear recommendations on the vaccination on renal transplantation (RT) patients, available data suggest that HBV and *influenza* vaccination can be performed in these patients for *influenza* vaccine; annual vaccination with the standard dose should be performed in RT patients. For HBV vaccine, the preferred approach should be to vaccinate early before dialysis and to reach a protective antibody level in all patients before transplantation (**Watkins , et al ,.2002**)

Vaccines remain an underused tool for the prevention of infectious complications with renal disease (**Dinitis, et al ,.2004**)

### **Aim of The Essay:**

The aim of this essay is to:

- Review the different protocols of vaccination in CKD.
- Determine the protocol of vaccination in predialysis patients , patients on peritoneal & hemodialysis and in renal transplantation