

**PREGNANCY IN DIALYSIS PATIENTS,
OUTCOMES, COMPLICATIONS,
AND MANAGEMENT**

Essay

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Degree of **General Medicine**

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CONCLUSION

Pregnancy is a challenge for women with kidney disease, and this is especially true for dialysis patient. Pregnancy in women with ESRD undergoing dialysis treatment is uncommon but increasingly observed over the last few years.

Pregnancy in dialysis patients remains a high-risk undertaking for both the patient and the fetus. There are large gaps in our knowledge base regarding the effect of the abnormalities associated with renal failure on pregnancy.

The aim of this essay is to throw lights on the recommendations regarding dialysis modalities, prescription and adequacy for the pregnant woman, to have a successful outcome for the pregnant dialysis patients.

The kidney is among the organs in the body most significantly affected by pregnancy. The kidneys undergo pronounced haemodynamic, renal tubular and endocrine changes during pregnancy. During healthy pregnancy the kidney increases production of erythropoietin, active vitamin D, and rennin.



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

وَقُلْ رَبِّ
زِدْنِي عِلْمًا

صِرَاقُ اللَّهِ الْعَظِيمِ

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*Above all and first of all thanks to **ALLAH***

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LIST OF ABBREVIATIONS

Abbrev.	Full term
ACE	Angiotensin-converting enzyme
ACOG	American College of Obstetrics and Gynecology
ARBs	Angiotensin Receptor Blockers
BUN	Blood Urea Nitrogen
CKD	Chronic kidney disease
CNIs	Calcineurin Inhibitors
EDTA	European Dialysis and Transplantation Association
ESRD	End-stage renal disease
FDA	Food and Drug Administration
FF	Filtration Fraction
FSGS	Focal Segmental Glomerulosclerosis
GBM	Glomerular Basement Membrane
GFR	Glomerular filtration rate
HCG	Human Chorionic Gonadotropin
HD	Hemodialysis
HDF	Haemodiafiltration
HELLP	Hemolysis, Elevated Liver enzymes, Low Platelet count
KDIGO	Kidney Disease: Improving Global Outcomes
LBW	Low Birth Weight
MDRD	Modification of Diet in Renal Disease
Mes GN	Mesangioproliferative Glomerulonephritis
MGN	Membranous Glomerulonephritis

LIST OF ABBREVIATIONS (Cont...)

Abbrev.	Full term
mTOR	Mammalian Target of Rapamycin
NHD	Nocturnal Hemodialysis
NICU	Neonatal Intensive Care Unit
P:C ratio	Protein-to-Creatinine ratio
PD	Peritoneal dialysis
RPF	Renal plasma flow
SLE	Systemic Lupus Erythematosus
TPN	Total Parenteral Nutrition
VEGF(121)	Vascular Endothelial Growth Factor(121)

INTRODUCTION

Pregnancy is a challenge for women with kidney disease, and this is especially true for dialysis patient (*Bolignano et al., 2008*).

Pregnancy in women with end-stage renal disease (ESRD) undergoing dialysis treatment is uncommon but increasingly observed over the last few years (*Okundaye et al., 1998*).

Pregnancy in dialysis patients remains a high-risk undertaking for both the patient and the fetus. There are large gaps in our knowledge base regarding the effect of the abnormalities associated with renal failure on pregnancy (*Hou and Firanek, 2003*).

In 1971 Confortini et al. reported the first successful pregnancy in a woman on chronic hemodialysis (HD). In 1980, the European Dialysis and Transplantation Association (EDTA) reported a pregnancy incidence of 0.9%. Other publications reported pregnancy in 1–7% in women on chronic dialysis (*Chao et al., 2002*).

Moreover, pregnancy in contemporary women on dialysis is more likely to be successful, with 30–50% of pregnancies resulting in delivery of surviving infant (*Toma et al., 1999*).

Introduction

Early diagnosis of pregnancy in ESRD requires careful attention as irregular menses, amenorrhea and nausea are common in this group and elevated beta-subunit of human chorionic gonadotropin has been observed in some patients with renal failure which may give a false-positive pregnancy test, late diagnosis delays the intensive antenatal care and reduce the successful outcome (**Hou, 1999**).

The outcome of pregnancies in dialysed women is greatly influenced by maternal risk factors. During gestation, various risks may appear including the mother's fluid overload, hypertension, anaemia and an increased risk for fetal and perinatal complications such as neonatal mortality, prematurity and small-for-gestational-age (**Hou and Firanek, 2003**).

Anemia occurs during pregnancy and pregnant dialysis patients require intensive management of anemia. Erythropoietin has been given safely to pregnant dialysis patients (**Walsh, 2002**).

Erythropoietin doses need to be increased by approximately 50% in order to maintain target hemoglobin levels of 10–11 g/dl. In addition, intravenous iron (**Hou, 1999**) appears to be safe during pregnancy however frequent monitoring of iron stores is recommended (**Walsh, 2002**).

Introduction

Hypertension is the most frequently reported maternal complication in this population, occurring in 42–80% of these women (*Giatras et al., 1998*).

Antihypertensive medications are often required to maintain maternal diastolic blood pressure in the 80–90 mmHg range (*Levy et al., 2005*).

Similarly dialysate adjustment may be needed to maintain appropriate levels of serum calcium and to avoid hypocalcemia and/or post-treatment hypercalcemia. Since the placenta converts some 25-hydroxyvitamin D3 to 1, 25-dihydroxyvitamin D3, adjustment of vitamin D may be required during pregnancy and should be guided by measurement of levels of vitamin D, parathyroid hormone, calcium and phosphorus (*Walsh, 2002*).

A significant correlation between hours spent on dialysis therapy and improved fetal outcome has been reported. The increase in dialysis time seems to improve the pregnancy outcome and offer several advantages (*Blowey and Warady, 2006*).

Most published reports hint at better pregnancy outcomes in haemodialysis patients undergoing intensified dialysis regimens. Still, only 40–85% of pregnancies in women on dialysis result in a surviving infant (*Eroglu et al., 2004*).

Introduction

Haemodiafiltration (HDF) was chosen to further increase the effectiveness and safety of the dialysis prescription, for even in critically ill patients daily haemodia-filtration enjoys excellent cardiovascular tolerance (**Marshall et al., 2004**).

Successful pregnancy in peritoneal dialysis (PD) patients may be limited by restricted abdominal volume due to rapid growth of the gravid uterus. Because drainage pain may be encountered, reduction in exchange volumes with increased frequency of exchanges may be necessary (**Hou, 1999**).

The number of successful pregnancies in dialysis patients has improved over the years (**Holley and Reddy, 2003**).

The outcome is better in patients who conceived before starting dialysis compared with those who became pregnant while on dialysis (**Blowey and Warady, 2006**).

The survival of the fetus and the safety of the mother depend on close cooperation among all the specialities involved, including nurses, doctors, nutritionists, and social workers from nephrology, perinatology, and neonatology (**Holley and Reddy, 2003**).

AIM OF THE WORK

The aim of this essay is to throw lights on the recommendations regarding dialysis modalities, prescription and adequacy for the pregnant woman, to have a successful outcome for the pregnant dialysis patients.