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Case Report

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A Case of Short- Term Intensive Care Unit-Acquired Weakness Post-Renal Graft Nephrectomy after Liver and Kidney Transplant

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ABSTRACT

Background: In this study, we shed the light on the effect of two short-term ICU admissions within short period in-between admissions and the undesirable results in core muscles, lower limb motor power and physical abilities. We emphasized the importance of early intervention of physical therapy during ICU admission and after.

Case Report: This study involved a 58 years old female patient with CKD and liver cirrhosis long years ago, underwent living-donor kidney and liver transplant procedure in September 2021, and was admitted in ICU for one week. Few months later, investigation revealed poor kidney function and renal graft nephrectomy was done in December 2021. Patient was admitted one week in ICU after renal graft nephrectomy. Core muscles, lower limb muscles and physical abilities were measured pre and post ICU admission after renal graft nephrectomy and at the time of discharge from physical therapy service.

Result: Motor power was measured before renal graft nephrectomy and ICU admission classified and measured as follows: core muscles, hip flexors, adductors and abductors graded 3/5, hams and quad graded 3+/5, patient was able to stand up from sitting on regular chair and able to walk without assistance. Post renal graft nephrectomy and ICU admission the MRC was as follows: core muscles, hip flexors, adductors and abductors graded 2-/5, hams and quad graded 3-/5, patient was unable to stand up from regular chair and has poor standing balance. Patient was followed up in physical therapy eight weeks in total, four weeks in in-patient setting and four week in OPD. The discharge assessment shows improvement in hams and quad motor power measured 4/5, good core muscles and hip muscles measured 4/5. Patient was ambulatory without assistive device at the time of discharge from physical therapy service.

Conclusion: Short-term ICU admission can acquired weakness if patient has repeated ICU admissions within short period.

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Keywords: ICUAW, LDKT, Rehabilitation, Nephrectomy

Abbreviations
ICUAW: ICU-acquired weakness
MRC: Medical Research Council

Introduction

It has been reported in many articles that intensive care unit can acquired weakness in many patients especially those who are critically ill in ICU [1-5]. Many factors can be classified as risk factors, include gender, APACHE score, average medical research council score, number of days of ICU stay and number of days of mechanical ventilation [6-8]. Early intervention of physical therapy and ERAS is highly recommended to avoid limitation in ADL activities and future disability [9-15]. However, no literature proves that on short-term ICU admission, especially those who underwent many procedures and was in ICU many times within short period in-between admissions. A case of short-term ICUAW post renal graft nephrectomy after kidney and liver transplant is presented.

Presentation of Case

This study involved a 58 years old female patient with CKD and liver cirrhosis long years ago was complaining of abdominal pain, nausea, lose weight, lose appetite and was on kidney dialysis three times/week. Patient was able to do her ADL independently and was able to stand up from regular chair with good balance and without physical limitations. In September 2021 patient underwent living-donor kidney and liver transplant procedure and was in ICU for one week, MRC was within acceptable scores. After transferred the patient to the unit, patient was fatigued, lost her appetite, has lower limb edema and low urine output. Investigation revealed poor function of the donor kidney (Image 1), (Table 1). Three months later in December 2021, patient underwent renal graft nephrectomy and was in ICU for one week. Enrolled in kidney dialysis three times/week. After ICU admission and renal graft nephrectomy, patient start feeling of weakness in lower limb muscles and body core muscles. Patient was not able to stand up from sitting position on regular chair and was not able to walk without assistance. Poor standing balance, weak hip muscles and core muscles were all noticed. Patient enrolled in rehabilitation plan post ICU admission after the renal graft nephrectomy for

four weeks in in-patient setting and four weeks in OPD after discharge from hospital and showed dramatic improvement in physical ability and motor power. Able to stand up from sitting on regular chair and able to walk without assistive device and discharged from physical therapy service with full functional independence and normal motor power.

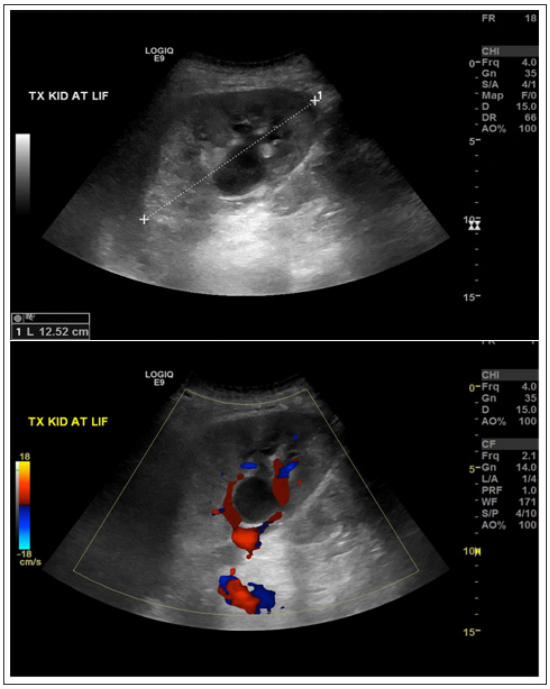

Image 1: Ultrasound renal transplant: Findings are in keeping with renal graft dysfunction. Persistent hydronephrosis of the renal graft with debris material in the renal pelvis

Table 1: Renal/Lyte Panel after Living -Donor Kidney Transplant Procedure (Ldkt) Procedure

	Day 1	Day 2	Day 3	Day 4	Day 5
Sodium	140	139	136	134	133
Potassium	3.2	3.7	3.8	4.4	4.7
Chloride	107	103	104	102	101
Bun	13.4	9.7	12.5	12.3	15.7
Creatinine	256	233	302	293	364
MDRD EPI calculator GFR	17.21	19.28	14.09	14.68	11.24

Clinical Examination

Our patient underwent two initial examinations, one after each procedure, and daily follow up evaluation after each initial evaluation. Follow up evaluation sessions were started in in-patient setting and continued in OPD after discharge from in-patient. Functional independence measure (FIM) after the living-donor kidney and liver transplant procedure was 126. On the other hand, after the renal graft nephrectomy FIM score was decreased dramatically from 126 to 101.

MRC after the living-donor kidney and liver transplant procedure was within acceptable scores (Table 2). Sever weakness in motor power was noticed after the renal graft nephrectomy and patient was unable to stand up from sitting position on regular chair (Table 3).

Table 2: Mrc Post- Ldkt Procedure and Icu Admission and before Renal Graft Nephrectomy

Muscles group	MRC score
Hip flexors	3/5
Hip abductors	3/5
Hip adductors	3/5
Quadriceps	3+/5
Hamstring	3+/5

Table 3: Mrc Post-Renal Graft Nephrectomy and Icu Admission and after Eight Weeks in Rehabilitation Course

Muscles group	MRC post-ICU admission	MRC after 8 weeks rehabilitation
Hip flexors	2-/5	4/5
Hip abductors	2-/5	4/5
Hip adductors	2-/5	4/5
Quadriceps	3-/5	4/5
Hamstrings	3-/5	4/5

Treatment Plan

Patient enrolled in rehabilitation program second day after transferred from ICU to the unit after renal graft nephrectomy. The plan was to improve motor power and functional abilities. Patient was under rehabilitation program for eight weeks in total, four weeks in in-patient setting and four weeks in OPD after discharge from in- patient.

Strengthening exercises for hams, quad and hip muscles was the main treatment to improve motor power and then encourage functional independence in ambulation and transferring activity.

Result

Patient's initial evaluation of MRC and FIM after living-donor kidney and liver transplant procedure were all-normal (Table 2). On the other hand, sever weakness and disability were noticed after the second ICU admission post renal graft nephrectomy within three months' differences in between the two procedures. (Table 3) Patient admitted one week in ICU after each procedure.

A significant improvement was noticed in 8th weak since the rehabilitation program was started. MRC was within normal scores as follows:

Hams and quad motor power measured 4/5; good core muscles and hip muscles measured 4/5. Patient was able to stand up from sitting position on regular chair and was ambulatory without assistive device at the time of discharge from physical therapy service. (Table 3). FIM was increased dramatically from 101 to 126.

Discussion

It has been reported that long-term admission in ICU enhance neuromuscular weakness, however no literature proves that on short-term admission especially those who underwent many procedures and was in ICU many times within short period in-between procedures [1-5]. Our case underwent two surgeries in short time. The donor kidney and liver transplant and the renal graft nephrectomy of the donor kidney with three months' differences in between admissions and was admitted one week in ICU after each procedure. Motor power and physical abilities affected with repeated ICU admissions within short period in between procedures. No article proves the effect of repeated ICU admissions on physical abilities and motor power.

Patient has poor function of the donor kidney; one article proves the poor outcomes of kidney transplant recipients [16]. She underwent renal graft nephrectomy three months later and was on dialysis three times/week.

Future studies are needed to confirm that short-term ICU can acquired weakness if patient has repeated ICU admissions even short- term admission. Our case was complaining of sever weakness in hip and core muscles after the last ICU admission, managed in in-inpatient setting and in OPD after discharge. Patient discharge from PT service with good motor power and without assistive device. Articles already approved that early intervention of physical therapy after liver and renal transplantation can improve patient' motor power and quality of life [17-19].

Conclusion

Short-term ICU admission can acquired weakness if patient has repeated ICU admissions within short period.

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