UNIVERSIDADE FEDERAL DE SANTA CATARINA

MAIARA SCHVAMBACH DEGGAU

VIABILIDADE E SEGURANÇA DE DOIS INSTRUMENTOS DE AVALIAÇÃO DA PERFORMANCE FÍSICA EM PACIENTES INTERNADOS NA UTI APÓS TRANSPLANTE HEPÁTICO

Florianópolis

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Trabalho de Conclusão apresentado ao Curso de pós-graduação de Residência Integrada Multiprofissional em Saúde, como requisito parcial para obtenção da Especialização de Fisioterapeuta em Alta Complexidade.

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ATA DA BANCA DE TRABALHO DE CONCLUSÃO DE CURSO

No dia cinco de dezembro do ano de dois mil e vinte e três, em sessão presencial deu-se a defesa do Trabalho de Conclusão de Residência (TCR) intitulado **"Viabilidade e segurança de dois instrumentos de avaliação da performance física em pacientes internados na UTI após transplante hepático"**, elaborado e defendido por Maiara Schvambach Deggau orientada por Profa. Dra. Aline Almeida Gulart. A Banca Avaliadora constituída por Me. Mariana Lanzoni Campos e Dra. Kelly Cattelan Bonorino (X) Aprovou ou ( ) Não Aprovou o referido trabalho. A nota final da banca será emitida somente após a entrega dos documentos previstos para a disciplina de TCR (**entrega até 11/12/2023**). A Coordenação da RIMS registra, publica, assina e dá fé à presente ata.

Florianópolis, 05 de dezembro de 2023.

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Viabilidade e segurança de dois instrumentos de avaliação da performance física em pacientes internados na uti após transplante hepático.

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Viabilidade e segurança de dois instrumentos de avaliação da performance física em pacientes internados na uti após transplante hepático.

RESUMO

Introdução: O transplante hepático é o tratamento para doenças hepáticas em fase terminal, que muitas vezes cursam com alterações fisiológicas e podem levar à diminuição da performance física e desenvolvimento de fragilidade. A *Short Physical Performance Battery* (SPPB) e o *Liver Frailty Index* (LFI) são ferramentas recomendadas para avaliar esses desfechos, porém não existem estudos que utilizem essas ferramentas para avaliar o paciente internado na unidade de terapia intensiva (UTI) após o transplante hepático. ***Objetivo:*** Analisar a viabilidade e segurança da aplicação da SPPB e do LFI para avaliar a performance física de pacientes submetidos a transplante hepático internados na UTI. ***Métodos*****:** Os participantes foram avaliados ainda na UTI, entre 24 e 96h pós extubação, quando apresentaram condições clínicas para sair do leito. As avaliações foram realizadas em um único período, na seguinte ordem: escala *Medical Research Council* (MRC), dinamometria de preensão palmar, teste de equilíbrio em pé, teste de sentar-e-levantar de 5 repetições e teste de velocidade marcha de 4 metros. Os resultados individuais foram utilizados para formar a pontuação final da SPPB e do LFI. ***Resultados*****:** Cinco participantes concluíram o estudo e nenhum apresentou instabilidade hemodinâmica, queda de SpO2 ou perda de dispositivo invasivo durante as avaliações. ***Conclusão*****:** A avaliação de pacientes pós transplante hepático internados em UTI, a partir da SPPB e do LFI, foi viável e segura nas primeiras 96h pós extubação do paciente.

PALAVRAS-CHAVE

Transplante de Fígado; Fragilidade; Desempenho Físico Funcional; Unidade de Terapia Intensiva.

The feasibility and safety of two physical performance evaluating tools in ICU patients after liver transplantation.

ABSTRACT

Introduction: Liver transplantation is the treatment for end-stage liver diseases, which can cause physiological changes and lead to waning physical performance and frailty. The two recommended evaluating tools for these outcomes are the Short Physical Performance Battery (SPPB) and the Liver Frailty Index (LFI). However, no studies have been made using these tools to evaluate patients in intensive care units (ICU) after liver transplantation. ***Objectives:*** analyse the feasibility and safety of applying SPPB and LFI methods to evaluate the physical performance of ICU patients who underwent liver transplantation. Methods: the patients were evaluated while still in the ICU, between 24 and 96 hours after their extubation, as soon as they were able to mobilize out-of-bed. All evaluations with each patient took place in a single session, in the following order: Medical Research Council (MCR) scale; handgrip strength test; balance test; five times sit-to-stand test; and four-meter gait speed test. These results were used to determine each patient's final score in SPPB and LFI. ***Results:*** five participants have completed the study and none of them presented hemodynamic instability, drop in SpO2 levels, or loss of their invasive devices. ***Conclusions:*** The evaluation of ICU patients using SBBP and LFI was proven feasible and safe in the first 96 hours after the patient’s extubation.

KEYWORDS

Liver transplantation; Frailty; Physical Functional Performance; Intensive Care Unit.

INTRODUÇÃO

O transplante hepático é o tratamento definitivo para pacientes com doenças hepáticas em estágio terminal.[1] A grande maioria desses indivíduos, especialmente aqueles com maiores pontuações no *Model for End-Stage Liver Disease* (MELD), irão precisar de cuidados intensivos no pós-operatório (PO), por um tempo que varia em média de 2 a 10 dias.[2] Esse tempo ainda pode aumentar, dependendo das condições do paciente pré-transplante.[2,3]

Pacientes cirróticos comumente cursam com uma condição de fragilidade e redução da massa muscular, resultantes de um complexo processo decorrente da miotoxicidade da amônia, distúrbios metabólicos, má-nutrição e outros fatores associadas à doença hepática,[4] o que gera diminuição da capacidade aeróbica, limitação da capacidade funcional desses pacientes e grande impacto na performance física.[5,6]

Alguns estudos têm demonstrado que uma baixa performance física e a presença de fragilidade aumentam o número de internações hospitalares por descompensação do quadro de cirrose e mortalidade na lista de espera por transplante hepático.[7,8] Naqueles pacientes que passam pelo transplante, a presença de fragilidade clínica e redução da performance física aumentam o tempo de permanência hospitalar e readmissão hospitalar dentro dos três primeiros meses,[3] e se associa a maiores taxas de falha do enxerto e mortalidade pós transplante.[9] Somado a isso, esses pacientes podem cursar com complicações intra e pós operatórias que aumentam o risco de mortalidade, incidência de infecções, tempo de internação hospitalar e na unidade de terapia intensiva (UTI), incidência de fraqueza muscular adquirida na UTI (FMA-UTI) e readmissões hospitalares pós transplante hepático.[1,4,10] Portanto, a avaliação da performance física e a triagem para fragilidade clínica nestes pacientes pode ser importante já nos primeiros dias de PO.

Existe ainda uma dificuldade em diagnosticar a fragilidade clínica de pacientes internados na UTI, devido à restrição de espaço físico e à crença de que equipamentos de monitoração, drenos e cateteres são barreiras à mobilização.[11,12] Além disso, esses pacientes apresentam maior risco de instabilidade durante a execução de esforços. Por isso, é importante que se escolham instrumentos que sejam viáveis e seguros para avaliação de pacientes que se encontram internados na UTI.

A *Short Physical Performance Battery* (SPPB) é um teste de performance física que pode diagnosticar fragilidade física,[12,13] sendo recomendada e utilizada em pacientes no pré e PO de transplante hepático.[3,13] Desenvolvido por Lai et al., (2017) o *Liver Frailty Index* é um índice contínuo e quantitativo que utiliza três instrumentos já bem estabelecidos na literatura para

avaliação de fragilidade e performance física para avaliar de forma objetiva a fragilidade de pacientes com doenças hepáticas terminais e predizer mortalidade desses pacientes enquanto aguardam um transplante. Embora sejam recomendados e utilizados para avaliar pacientes cirróticos em lista de transplante[7,14,15] e pós transplante,[3,4] não existem estudos que utilizem esse instrumento para avaliar o paciente no PO imediato de transplante, ainda dentro da UTI. Por este motivo, não se sabe se é viável e seguro aplicar esta ferramenta dentro do ambiente intensivo com pacientes transplantados.

Diante do exposto, o objetivo deste trabalho é analisar a viabilidade e segurança da aplicação da SPPB e do LFI para avaliar a performance física de pacientes submetidos a transplante hepático, nas primeiras 96 horas de internação na UTI.

MATERIAIS E MÉTODOS

Desenho do estudo

Este é um estudo observacional e de caráter transversal, que foi conduzido na UTI adulto de um Hospital Universitário (HU) da região Sul do Brasil e foi relatado de acordo com o *Strengthening the Reporting of Observational Studies in Epidemiology* (*STROBE*). O estudo foi aprovado pelo Comitê de Ética em Pesquisa da UFSC (CEP-UFSC) sob o CAAE 67536623.3.0000.0121. Todos os participantes expressaram seu consentimento através da assinatura do Termo de Consentimento Livre e Esclarecido. O estudo foi conduzido entre os meses de março e outubro de 2023.

Participantes

Foram incluídos no estudo adultos com idade igual ou superior a 18 anos, internados na UTI do HU em questão-UFSC, após cirurgia de transplante hepático, de 24 a 96 horas após extubação, que apresentaram nível de consciência adequado para interagir com o fisioterapeuta e compreender os comandos dos testes e que tinham condições de sentar-se à beira do leito ou em poltrona fora do leito. Como critérios de exclusão foram adotados: incapacidade de executar as avaliações propostas; diagnóstico de doenças pulmonares, neurológicas, ortopédicas ou reumatológicas incapacitantes; hipertensão arterial sistêmica não controlada e instabilidade hemodinâmica com necessidade de altas doses de drogas vasoativas (> 0,2 µg/kg/min de noradrenalina, > 0,08 U/min de vasopressina ou doses equivalentes de outros vasopressores);[16]

presença de deiscência de sutura com risco de evisceração no momento da aplicação dos testes; evolução para outros quadros de doença crítica que não estivessem associados às complicações comuns ao transplante ou às infecções relacionadas à assistência à saúde.

Procedimento para Coleta de Dados

Foram extraídos do prontuário eletrônico os seguintes dados para caracterização da amostra: idade, sexo, tabagismo ou etilismo, causa de falência hepática e necessidade de transplante, comorbidades, classificações MELD (e sua variante que inclui níveis séricos de sódio, MELD-Na), CHILD, S*implified Acute Physiology Score III* (SAPS III), tempo de cirurgia, complicações transoperatórias, tempo de internação em UTI e hospitalar, tempo de VM e necessidade e tempo de VNI pós extubação.

A avaliação da performance física foi iniciada entre 24h e 96h após extubação, assim que o participante apresentou nível de consciência adequado, condições de sentar-se à beira ou fora do leito e estabilidade hemodinâmica, sem ou com doses baixas de vasopressores. As avaliações foram realizadas em um único dia, na seguinte ordem: inicialmente avaliou-se a força muscular periférica a partir da MRC e da dinamometria de preensão palmar. Na sequência, foi realizada a avaliação da performance física pelo SPPB e pelo LFI.

***Medical Research Council* (MRC)**

A escala do MRC é a ferramenta mais amplamente utilizada dentro de UTIs para avaliar a FMA-UTI.[17] Foram testados os seis grupos musculares preconizados no teste: abdutores de ombro, flexores de cotovelo, extensores de punho, flexores de quadril, extensores de joelho e dorsiflexores de tornozelo, bilateralmente. A avaliação foi realizada com o participante sentado em poltrona. Cada movimento era pontuado em uma escala de 0 a 5 pontos, e ao final do teste, as pontuações alcançadas foram somadas, podendo o participante pontuar entre 0 e 60 pontos.[18] Para fins de análise, foi utilizado o escore total e os participantes foram categorizados com ou sem FMA-UTI de acordo com o ponto de corte de 48. A escala e sua forma de pontuação se encontram no Apêndice A.

Dinamometria de Preensão Palmar

A dinamometria de preensão palmar avalia a força de contração isométrica dos músculos do antebraço e da mão.[7] Os participantes foram avaliados na posição sentada, em poltrona fora

do leito, com as costas apoiadas, o mais eretas possível. O membro superior dominante foi posicionado de forma que o cotovelo permanecesse flexionado à 90º. Foi utilizado um dinamômetro digital Jamar Plus + (Performance Health, IL, EUA) para a avaliação. A medida foi realizada por três vezes apenas na mão dominante do participante, que recebeu a orientação de apertar o aparelho com a maior força que conseguisse, mantendo-a por pelo menos seis segundos. O intervalo entre as três medidas foi de pelo menos 60 segundos.[19,20]

Para a análise, foram utilizados os valores absolutos da medida e também considerado o ponto de corte para FMA-UTI de acordo com o gênero: 7 kg/força para mulheres e 11 kg/força para homens.[4,19]

Short Physical Performance Battery **(SPPB)**

A SPPB foi aplicada para avaliar a performance física.[7,21] Ela é composta por três avaliações: equilíbrio em pé, velocidade de marcha e o teste de sentar-e-levantar de 5 repetições. Todos os testes foram realizados em sequência, com tempo de intervalo suficiente para o retorno dos sinais vitais aos valores basais.[7] A avaliação do equilíbrio foi realizada com o participante em posição ortostática, sem apoio, com os pés em três diferentes suportes: lado a lado, semi-alinhado e alinhado, nesta ordem, pelo tempo máximo de 10 segundos.[21,22]

A velocidade da marcha foi avaliada em um corredor plano com 4 metros de comprimento, com início e fim demarcados por um cone. O teste foi realizado duas vezes e a maior velocidade alcançada foi utilizada para análise.[22] Para o teste de sentar-e-levantar de 5 repetições, foi utilizada uma cadeira de 46 cm de altura, sem apoios para o braço, apoiada na parede. Os participantes foram orientados a cruzar os braços sobre o peito e se levantar da cadeira uma vez. Aqueles capazes de realizar o movimento foram instruídos a se levantar e sentar completamente por cinco vezes, o mais rápido possível. O tempo foi cronometrado desde a posição inicial sentada até a última posição em pé. Para fins de análise, foi utilizado o tempo em segundos.[21–23] Cada teste foi pontuado em uma escala de 0-4 pontos, podendo somar ao total até 12 pontos.[7] Os participantes foram classificados em três categorias: frágeis (pontuação total < 7); pré-frágeis (pontuação total de 7 a 9); e não frágeis (pontuação > 9).[24] A atribuição de pontuação para cada teste está descrita no apêndice B.

Liver Frailty Index (LFI)

O LFI avalia a performance física e foi desenvolvido por Lai *et al.* (2017) com base em instrumentos de avaliação já disponíveis para indivíduos cirróticos. É recomendado pela Sociedade Americana de Transplantes Hepáticos e Sociedade Americana para o Estudo de Doenças Hepáticas para identificar a fragilidade física em pacientes com doença hepática. [14,25,26]

É um índice contínuo e quantitativo calculado a partir da força muscular avaliada pela dinamometria de preensão palmar, do tempo de execução do teste de sentar-e-levantar de 5 repetições e tempo de equilíbrio, somando o tempo alcançado nas 3 posições do teste de equilíbrio em pé, conforme já descrito na avaliação da SPPB.[4,27] Todos esses testes foram executados em diferentes momentos da avaliação da performance física e da força muscular do participante e os dados coletados foram utilizados para gerar o LFI na calculadora disponibilizada gratuitamente de forma virtual no site https://liverfrailtyindex.ucsf.edu/. Os participantes foram classificados em não frágeis quando pontuaram < 3,2, pré-frágeis quando apresentaram pontuações entre 3,2 e 4,4, e frágeis quando pontuaram ≥ 4.5.[4]

Análise Descritiva

Foi realizada uma análise descritiva das seguintes variáveis: dispositivos invasivos aos quais o participante estava conectado; necessidade de suporte ventilatório para realização dos testes; medicamentos de infusão contínua - droga e dose, necessidade de interrupção do teste, possíveis instabilidades e eventos adversos durante o teste.

RESULTADOS

Durante o período do estudo, oito pacientes passaram pelo procedimento de transplante hepático e foram internados na UTI. Destes, um foi excluído por comorbidades neuromusculares prévias e dois foram excluídos por não apresentarem condições de saída do leito dentro das 96h pós extubação. Cinco participantes foram capazes de completar o estudo.

Dos cinco participantes, três estavam com sobrepeso e dois apresentavam peso normal. Um era ex-etilista, sóbrio há 1 ano, e dois eram ex-tabagistas. Os dados de caracterização da amostra se encontram na tabela 1. Quatro dos participantes realizaram a cirurgia de forma eletiva, enquanto um realizou o transplante de forma urgente. O tempo de cirurgia variou de

seis a oito horas, e apenas um paciente teve intercorrência durante o transoperatório, sendo um sangramento aumentado com necessidade de transfusão de concentrados de hemácia no centro cirúrgico. Esse mesmo paciente foi extubado no dia seguinte à cirurgia e precisou de VNI por um tempo total de 340 minutos. Os demais participantes foram extubados logo que admitidos na UTI e não fizeram uso de VNI.

Nenhum participante do estudo apresentou FMA-UTI de acordo com as pontuações alcançadas no MRC e pela dinamometria de preensão palmar. Todos os participantes conseguiram realizar a avaliação da SPPB e do LFI sem interrupções. Os dados referentes às avaliações se encontram na tabela 2. Segundo as pontuações da SPPB, um participante foi classificado como não-frágil, dois como pré-frágeis e dois como frágeis. Já para a LFI, um participante foi classificado como não-frágil, um como pré-frágil e três como frágeis.

No momento da avaliação, três participantes estavam com cateter venoso central em veia jugular interna direita e dois com acesso venoso periférico em membro superior; três ainda estavam em uso de dreno suctor em quadrante abdominal inferior direito. Quatro participantes ainda estavam com sonda vesical de demora e três com sonda nasoentérica ou nasogástrica. Apenas um estava com monitorização invasiva de pressão arterial. Nenhum paciente teve perda de dispositivo invasivo durante a execução das avaliações.

Nenhum participante precisou interromper a avaliação por fadiga ou dispneia, e nenhum teste foi interrompido por conta de aumento importante da PA e FC ou queda de SpO_2. Um dos participantes estava em uso de droga anti-hipertensiva em bomba de infusão contínua (Nitroglicerina a 16ml/h ou 53 mcg/min) sem necessidade de ajuste da dose durante a avaliação. E as únicas participantes a fazerem uso de oxigenoterapia, ambas do sexo feminino, já estavam em uso de cateter nasal de oxigênio com baixo fluxo (1 e 2 L/min) antes de iniciar o teste, e não foi preciso aumentar o fluxo de oxigênio para manter a saturação de pulso dentro do alvo estipulado para cada paciente. As variáveis pré e pós avaliação se encontram na tabela 3.

DISCUSSÃO

Nosso estudo avaliou um total de cinco pacientes pós procedimento de transplante hepático. Os resultados encontrados neste estudo sugerem que, nesses pacientes, a aplicação da SPPB e do LFI foi viável e segura dentro do ambiente intensivo. Todos os participantes do estudo estavam com algum dispositivo invasivo no momento das avaliações e nenhum deles apresentou perda ou exteriorização durante a realização dos testes. Apenas um dos pacientes

estava fazendo uso de medicação antihipertensiva contínua e não apresentou necessidade de ajuste de dose durante a realização dos testes.

Ainda que pacientes internados na UTI por tempo superior a 48h já apresentem declínio funcional importante, um estudo demonstrou que a frequência de avaliações funcionais objetivas nesses pacientes é baixa.[28] Uma vez que a maior parte das avaliações funcionais, como a SPPB e a LFI, envolvem que o paciente saia do leito, diversas barreiras são percebidas para sua aplicação na UTI, entre elas o uso de drogas vasoativas, acessos venosos e a segurança do paciente.[29] Entretanto, estudos já demonstraram que a frequência de eventos adversos durante a mobilização do paciente é baixa, cerca de 4%, e boa parte destes eventos são transitórios e com rápida recuperação após repouso.[29,30] Maffei *et al*., (2017) em estudo randomizado piloto com pacientes de transplante hepático, mostraram que um protocolo de reabilitação precoce é seguro e viável, com a ocorrência de poucos eventos adversos (59 em 4960 atendimentos de fisioterapia), sendo mais de 80% relacionados à dor. Outro estudo demonstrou que, durante o atendimento fisioterapêutico em UTI a pacientes pós transplante hepático, ocorre o aumento de FC, frequência respiratória, PA e dor nesses pacientes, mas que os valores retornam ao basal após 5 minutos de repouso, mostrando que as alterações fisiológicas causadas pela mobilização do paciente respondem dentro dos limites esperados, e que a mobilização é segura e viável. Esses dados corroboram os observados no presente estudo, onde nenhum participante apresentou eventos adversos, como perda de dispositivos, queda de SpO_2 ou alterações hemodinâmicas importantes durante as avaliações.

Ao que se sabe, esse foi o primeiro estudo a aplicar a LFI na UTI. Quanto à SPPB, alguns poucos estudos a utilizaram ainda UTI,[31,32] entretanto nenhum deles avaliou pacientes de transplante hepático. Além disso, a avaliação através da SPPB foi realizada apenas no momento da alta da unidade. Apesar do pouco uso dessas ferramentas na UTI, os testes que as compõem muitas vezes são utilizados de forma isolada nesse ambiente. A dinamometria de preensão palmar é uma ferramenta validada e amplamente utilizada na UTI para avaliação e diagnóstico de FMA-UTI,[19,33] e também como preditora de sucesso de desmame da VM[34,35] e de readmissão hospitalar em até 30 dias da alta hospitalar.[36] O teste de sentar-e-levantar é utilizado para avaliar a força de membros inferiores e funcionalidade,[37] e já se mostrou um instrumento seguro e de fácil execução para avaliar risco de queda e recuperação funcional em ambiente hospitalar e terapia intensiva.[38,39] Já a velocidade da marcha é uma avaliação simples, objetiva e validada da caminhada humana e possui algumas variações, sendo os testes de marcha de 4, 6 ou 10 metros as mais comuns, e pode ser utilizada com segurança no ambiente hospitalar.[40,41]

Uma vez que a maioria dos testes individuais citados no estudo são considerados viáveis e seguros quando utilizados em ambiente hospitalar e UTI, podemos inferir que eles podem ser utilizados de forma conjunta e sistematizada para avaliar a performance física dos pacientes nos primeiros dias de PO e formar as pontuações do SPPB e LFI. Além de identificar e classificar a fragilidade e predizer a mortalidade e desfechos desfavoráveis pré e pós transplante,[7,14,42] essas ferramentas possibilitam ao fisioterapeuta identificar déficits funcionais e montar um plano terapêutico mais assertivo para o paciente no PO de transplante hepático, traçando metas funcionais e prescrevendo um treino de marcha e força muscular com intensidade e carga individualizados.

A SPPB tem sido amplamente utilizada para avaliar a fragilidade e prever desfechos em pacientes em lista de transplante, tanto hepático[7,8], quanto renal[43] e pulmonar.[44] Apesar disso, ela não foi desenvolvida especificamente para pacientes de transplante hepático, enquanto a LFI foi criada para prever desfechos e mortalidade de pacientes com doença hepática em fase terminal que aguardam transplante.,[14] Assim,e por esse motivo é o LFI é descrito na literatura como uma avaliação mais sensível para detectar a fragilidade na população cirrótica.[4,15,27] De forma semelhante, em nosso estudo, mais pacientes foram classificados como frágeis pelo LFI do que pela SPPB.

Todos os participantes do nosso estudo conseguiram completar os testes incluídos na pontuação final das ferramentas SPPB e LFI. Uma das explicações possíveis para esse fato é que nenhum dos nossos participantes foi diagnosticado com FMA-UTI pela dinamometria ou pelo MRC. Considerando que quanto maior o tempo de VM maior o risco de FMA-UTI ,[17,29] uma explicação possível para que nenhum dos participantes do estudo tenha desenvolvido fraqueza é que todos foram submetidos a menos de 48h de ventilação mecânica, sendo quatro dos cinco participantes extubados pouco tempo após o término da cirurgia, logo que chegaram à UTI.

Esse estudo apresenta algumas limitações. Devido ao pequeno tamanho amostral, os resultados não podem ser extrapolados para toda a população pós transplante hepático. Dos elegíveis, nenhum apresentava FMA-UTI e, portanto, não podemos afirmar que a aplicação da SPPB e do LFI em pacientes com a força muscular prejudicada seja segura ou viável, uma vez que a redução da força pode impedir o paciente de realizar os testes em posição ortostática. Entretanto, poucos são os estudos de mobilização em pacientes internados em UTI pós transplante hepático e desconhecemos outro estudo que tenha avaliado a viabilidade e segurança das ferramentas SPPB e LFI dentro da UTI. Sugerimos que mais estudos, com tamanho amostral maior, sejam realizados para confirmar os presentes achados.

CONCLUSÃO

Os resultados do presente estudo sugerem que a avaliação da fragilidade física e performance funcional de pacientes pós transplante hepático internados em UTI, a partir da SPPB e do LFI, é viável e segura nas primeiras 96h pós extubação do paciente, não causando alterações importantes das variáveis fisiológicas estudadas ou eventos adversos como a perda de dispositivos invasivos.

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Tabela 1. Caracterização dos Participantes

	Sexo	Idade	IMC	Motivo Transplante	Caráter da cirurgia	Comorbidades	MELD-Na	CHILD	Presença de Complicações	Tempo VM (min)	MRC
1	M	60	24,8	Hepatocarcinoma, EHNA	Eletiva	Dislipidemia, HAS, DPOC, Hiperuricemia, DAC	10	B8	Sem complicações	423	60
2	F	53	25,9	Cirrose auto-imune	Urgência	Dislipidemia	34	C11	Sem complicações	714	60
3	M	73	19,0	Hepatite C, Hepatocarcinoma	Eletiva	Sem comorbidades	11	A6	Sem complicações	470	60
4	M	49	23,4	Cirrose auto-imune	Eletiva	Sem Comorbidades	23	C10	Sem complicações	595	59
5	F	52	27,3	EHNA	Eletiva	HAS, DM Tipo II	20	C10	Sangramento aumentado no transoperatório	1230	57

DAC: Doença Arterial Coronariana; DPOC: Doença Pulmonar Obstrutiva Crônica; DM: Diabetes Mellitus; EHNA: Esteato-Hepatite Não Alcoólica; F: Feminino; HAS: Hipertensão Arterial Sistêmica; Kg/F: quilogramas/força; M: Masculino; Min: minutos.

Tabela 2. Dados SPPB e LFI

	Dia PO	Equilíbrio em Pé (s)			Sentar-e-Levantar (s)	Marcha 4 metros (s)	Pontuação SPPB	Dinamometria (kg/f)	LFI
		Lado a lado	Semi Alinhados	Alinhados					
1	4º	10	10	10	11,93	3,62	11	29,2	3
2	**3º**	10	10	10	89,05	26,44	6	16,3	4,91
3	**2º**	10	10	10	21,3	3,68	9	19,5	4,71
4	**2º**	10	10	10	14,28	5,47	9	36,7	3,87
5	**4º**	10	10	2,23	28,42	19,66	4	10,7	5,27

LFI: *Liver Frailty Index;* PO: Pós Operatório; S: Segundos; SPPB: *Short Physical Performance Battery.*

Tabela 3. Variáveis Hemodinâmicas pré e pós testes

	FC Inicial (bpm)	PAS Inicial (mmHg)	PAD Inicial (mmHg)	SpO2 Inicial (%)	BORG Inicial	FC Final (bpm)	PAS Final (mmHg)	PAD Final (mmHg)	SpO2 Final (%)	BORG Final
1	82	174	65	96	0	-	-	-	-	-
2	91	149	76	95	3	115	130	79	95	4
3	85	139	74	95	1	80	139	74	95	3
4	81	129	84	98	0	105	144	91	98	0,5
5	95	156	64	93	2	100	157	90	92	5

BPM: batimento por minuto; FC: Frequência cardíaca; PAS: Pressão arterial sistólica; PAD: Pressão arterial diastólica; SpO2: Saturação Periférica de Oxigênio

APÊNDICES

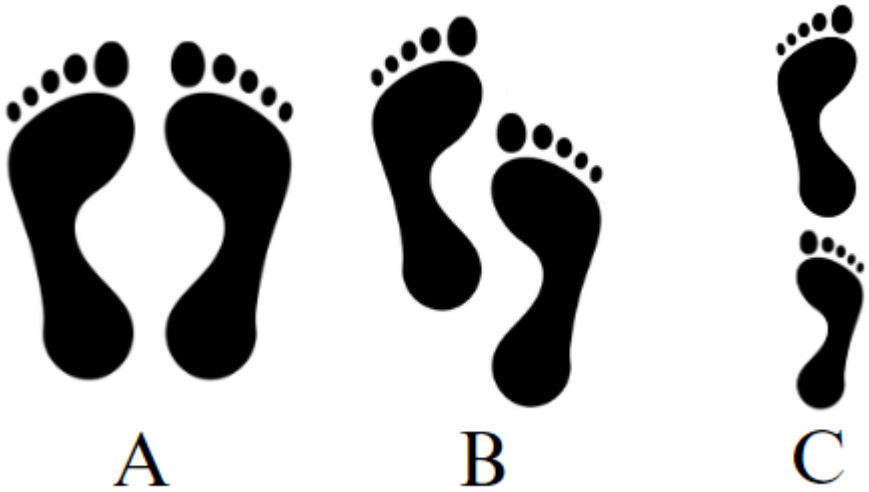
APÊNDICE A - *Medical Research Council*

Cada movimento preconizado pela escala MRC foi pontuado em até 6 graus: 5 quando o participante venceu toda a resistência aplicada; 4 quando foi capaz movimento contra alguma resistência; 3 quando conseguiu realizar o movimento contra a gravidade, mas não manteve a posição com aplicação de resistência; 2 quando conseguiu realizar algum grau de movimento com a eliminação da gravidade; 1 para quando apresentou contração muscular visível ou palpável, mas sem movimentação do segmento; e, por fim, grau 0 quando não houve nenhuma contração muscular. Ao final do teste, as pontuações dadas para cada movimento foram somadas, podendo a pontuação final variar de 0 a 60 pontos.[18]

APÊNDICE B - S*hort Physical Performance Battery*

A avaliação da SPPB se deu na seguinte ordem: primeiramente os participantes foram submetidos ao teste de equilíbrio em pé na seguinte ordem: pés lado-a-lado, pés semi alinhados e pés alinhados. Importante ressaltar que os participantes apenas avançavam para as posições mais avançadas caso conseguissem alcançar os 10 segundos de equilíbrio da avaliação imediatamente anterior. Após, realizavam o teste de sentar e levantar de 5 repetições e por último, a avaliação de marcha num trajeto de 4 metros previamente demarcado.

Figura 1. Posicionamento dos pés no teste de Equilíbrio em Pé. A: pés lado-a-lado; B: pés semi alinhados; C: pés alinhados.



Fonte: Elaboração das autoras, 2023

Quadro 1. Pontuação dos componentes da SPPB

	Equilíbrio em Pé (s)			Sentar-e-Levantar (s)	Velocidade de Marcha (s)
	Pés Lado-a-lado	**Pés Semi alinhados**	**Pés Alinhados**		
0	0 – 9.9	0 – 9.9	0 – 2.9	x	x
1	10	10	3 – 9.9	≥ 16.7	≥ 8.70
2	-	-	10	13.7 – 16.6	6.21 – 8.70
3	-	-	-	11.2 – 13.6	4.83 – 6.20
4	-	-	-	≤ 11.1	≤ 4.82

S: segundos; SPPB: *Short Physical Perfomance Battery*

F**onte:** Adaptado de Guranilk et al., (1994) e Nakano (2007).

APÊNDICE C- *Highlights*

HIGHLIGHTS

- O uso da SPPB e do LFI na UTI é viável para avaliação de fragilidade pós transplante hepático.
- O uso da SPPB e do LFI na UTI é seguro para avaliação de fragilidade pós transplante hepático.
- A avaliação da performance física pode ser feita nas primeiras 96h pós extubação.

ANEXO

BRAZILIAN JOURNAL OF PHYSICAL THERAPY

AUTHOR INFORMATION PACK

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ISSN: 1413-3555

DESCRIPTION

The *Brazilian Journal of Physical Therapy* (BJPT) is the official publication of the Brazilian Society of Physical Therapy Research and Graduate Studies (ABRAPG-Ft). It publishes original research articles on topics related to the areas of physical therapy and rehabilitation sciences, including clinical, basic or applied studies on the assessment, prevention, and treatment of movement disorders.

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INTRODUCTION

Types of article

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Potential authors are encouraged to read the following tutorial, which contains the minimum requirements for publication of systematic reviews in the BJPT: Mancini MC, Cardoso JR, Sampaio RF, Costa LCM, Cabral CMN, Costa LOP. Tutorial for writing systematic reviews for the Brazilian Journal of Physical Therapy (BJPT). Braz J Phys Ther. 2014 Nov-Dec; 18(6):471-480.

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