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UNIVERSIDADE ESTADUAL PAULISTA
“JÚLIO DE MESQUITA FILHO”
FACULDADE DE MEDICINA

Carolina Neiva Frota de Carvalho

**Caracterização da incontinência urinária específica da gestação
por ensaio de miografia *ex vivo* no músculo reto abdominal: Estudo
de corte transversal aninhado a coorte do Projeto DIAMATER**

Pregnancy-specific urinary incontinence characterization by rectus abdominis muscle ex vivo myography assay: Cross-sectional study nested within the DIAMATER Project cohort

Dissertação apresentada à Faculdade de Medicina, Universidade Estadual Paulista “Júlio de Mesquita Filho”, Campus de Botucatu, como parte dos requisitos para obtenção do título de Mestre em Tocoginecologia

Orientadora: Prof.^a Emérita Marilza Vieira Cunha Rudge
Coorientadores: Prof.^a Dra. Angélica Mércia Pascon Barbosa
Dr. David Rafael Abreu Reyes

Botucatu
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2022

FICHA CATALOGRÁFICA ELABORADA PELA SEÇÃO TÉC. AQUIS. TRATAMENTO DA INFORM.
DIVISÃO TÉCNICA DE BIBLIOTECA E DOCUMENTAÇÃO - CÂMPUS DE BOTUCATU - UNESP
BIBLIOTECÁRIA RESPONSÁVEL: ROSEMEIRE APARECIDA VICENTE-CRB 8/5651

Carvalho, Carolina Neiva Frota de.

Caracterização da incontinência urinária específica da gestação por ensaio de miografia ex vivo no músculo reto abdominal : estudo de corte transversal aninhado a coorte do Projeto DIAMATER / Carolina Neiva Frota de Carvalho. - Botucatu, 2022

Dissertação (mestrado) - Universidade Estadual Paulista "Júlio de Mesquita Filho", Faculdade de Medicina de Botucatu
Orientador: Marilza Vieira Cunha Rudge
Coorientador: Angélica Mércia Pascon Barbosa
Coorientador: David Rafael Abreu Reyes
Capes: 40101150

1. Gravidez. 2. Incontinência urinária. 3. Reto do Abdome.
4. Miografia. 5. Estudos transversais.

Palavras-chave: Análise ex vivo; Gestação; Incontinência urinária; Miografia; Músculo reto abdominal.

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Botucatu, 25 de fevereiro de 2022



Dedicatórias

Em primeiro lugar a **Deus**, por sempre guiar e iluminar o meu caminho e por ter me dado força, fé e perseverança para a concretização deste trabalho.

Aos meus pais **Cynthia** e **Alcione**, que muitas vezes renunciaram aos seus próprios sonhos para a realização dos meus, pelo suporte e por todo amor e confiança que sempre depositaram em mim.

Ao meu marido **Danilo**, pela paciência, companheirismo e apoio incondicional nesta jornada, mesmo nos momentos mais difíceis.

Ao meu irmão **Alexandre**, minha cunhada **Renata** e meus sobrinhos **Arthur** e **Isadora**, pelo incentivo e por me encorajarem a trilhar o meu caminho e alcançar os meus objetivos.

Aos meus familiares, em especial a minha avó **Stélia** e minha tia/madrinha **Christinne**, por sempre rezarem e torcerem pelo meu sucesso pessoal e profissional.

A todos aqueles que colaboraram direta ou indiretamente na realização deste trabalho, o meu apreço e a minha eterna gratidão.

Agradecimientos

À minha orientadora **Profa. Emérita Marilza Rudge**, por toda sua sabedoria, dedicação, por ser exemplo de luta e trabalho e pela oportunidade oferecida.

À minha coorientadora querida e incansável **Profa. Dra. Angélica Barbosa**, por se fazer presente em todas as etapas da execução do projeto, pela disponibilidade, competência, orientação técnica e científica, e por sempre estar disposta a ouvir e contribuir com palavras que confortam e aconselham.

Ao meu coorientador **Dr. David Reyes** e à aluna de pós-doutorado **Dra. Juliana Floriano**, por me auxiliarem na elaboração de uma parte fundamental deste trabalho e por destinar o seu tempo para participar dessa pesquisa.

À **Profa. Dra. Iracema Calderon**, por seus ensinamentos, conhecimento e generosidade. Gratidão é a palavra que melhor define o meu sentimento desde o momento em que a conheci.

Às **Profas. Dras. Patrícia Rossignoli, Cristiane Pedroni e Selma Matheus** e aos alunos de doutorado **Nilton Santos e Felipe Cantore**, por compartilharem a sua experiência, colaborando com o desenvolvimento deste mestrado.

Ao grupo de Pesquisa **Diamater**, em especial as amigas **Adriely Morgenstern e Luana Fávaro**, por estarem comigo nessa caminhada cheia de percalços, sempre ao meu lado, mostrando o verdadeiro sentido da amizade; **Dra. Fernanda Bérgamo**, pela disposição em ajudar o próximo e por me receber com um sorriso capaz de iluminar até os dias mais nublados; **Gabi Garcia**, nossa

gênia tecnológica e criativa, que dá cor, forma e vida às nossas ideias e esboços e ao amigo **Rafael Guillen**, super parceiro de laboratório, que eu admiro, e exemplo de pesquisador, sempre disposto a colaborar e ensinar.

Às **gestantes**, que participaram voluntariamente deste estudo, meus mais sinceros agradecimentos pela contribuição.

Aos funcionários do **Programa de Pós-Graduação da Faculdade de Medicina de Botucatu**, e ao **Departamento de Tocoginecologia**, em especial à **Solange Sako**, por toda atenção e paciência.

À **Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Brasil (CAPES)** pelo apoio ao Programa de Pós-Graduação em Tocoginecologia.

À **Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP)**, pelo financiamento do Projeto Temático processo 2016/01743-5, que possibilitou a execução deste mestrado.

Ao Escritório de Apoio à Pesquisa, **Cinthia** e **Cássia**, por toda colaboração e competência dispensadas a mim e a este projeto.

Ao professor **Dr. José Eduardo Corrente**, por executar de forma ímpar a análise dos dados deste mestrado.





Epígrafe

“Conheça todas as teorias, domine todas as técnicas, mas ao tocar uma alma humana, seja apenas outra alma humana”.

Carl Jung

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Lista de abreviações

Português e Inglês

Lista de abreviações em Português

CEP	Comitê de Ética em Pesquisa
CIDPN	Centro de Investigação do Diabetes Perinatal
DM	diabetes mellitus
DMG	<i>diabetes mellitus</i> gestacional
Dra.	doutora
FAPESP	Fundação de Amparo à Pesquisa do Estado de São Paulo
FFC	Faculdade de Filosofia e Ciências
FMB	Faculdade de Medicina de Botucatu
IU	incontinência urinária
IU-EG	incontinência urinária específica da gestação
MAP	músculos do assoalho pélvico
MRA	músculo reto abdominal
Prof. ^a	professora
UNESP	Universidade Estadual Paulista

Lista de abreviações em Inglês

%	percentage
ADA	American Diabetes Association
BMI	body mass index
Cm	centimeter
Cm ²	square centimeter
DM	diabetes mellitus
GDM	Gestational Diabetes Mellitus
ICS	International Continence Society
IUGA	International Urogynecological Association
Max	maximum
Min	minimum
PDRC	Perinatal Diabetes Research Center
PFM	pelvic floor muscles
PSUI	Pregnancy-specific urinary incontinence
UI	urinary incontinence



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Seção 1

Trajetória Acadêmica

Iniciei a minha formação acadêmica em 2002, ingressando no curso de Fisioterapia pela Faculdade Santa Terezinha - CEST, em São Luís - MA. Nesses 4 anos e meio pude me dedicar intensamente, aprender e amadurecer como profissional, me apaixonando ainda mais pela fisioterapia.

Atuei durante 8 anos (2008-2016) no Hospital e Maternidade Marly Sarney (HMMS), referência em atendimento no estado do Maranhão, onde, após a graduação, tive o primeiro contato com gestantes de risco habitual e alto risco.

Fui coordenadora da Clínica de Saúde Integrada entre 2012 e 2016, além de ter trabalhado em diversas clínicas e estúdios em São Luís e em Parnaíba - PI.

Tive a oportunidade de imergir em uma nova cultura e aperfeiçoar o idioma (inglês) quando morei no Canadá, de fevereiro de 2016 a fevereiro de 2017, pois além de ter participado de voluntariados, pude estudar e trabalhar.

Ao retornar, iniciei a pós-graduação em Fisioterapia Pélvica e Uroginecologia Funcional e, em seguida, Fisioterapia Dermatofuncional, tendo realizado os dois trabalhos de conclusão de curso com a temática “Saúde da Mulher”, o que reacendeu o meu desejo de voltar a atuar nessa área. Considero que esses dois títulos foram essenciais para o impulso e continuidade da minha jornada acadêmica.

Em 2019, antes de entrar oficialmente no PPG em Tocoginecologia como mestranda, integrei o grupo de pesquisa “Diabete e Gravidez – Clínico e Experimental” da Faculdade de Medicina de Botucatu (FMB – Unesp), liderado pela Profa. Emérita Marilza VC Rudge, participando de reuniões, treinamentos e coletas, me permitindo, assim, realizar o mestrado em um período menor que o habitual.

Em 2021 iniciei o mestrado pelo Projeto Temático FAPESP DIAMATER, “*The Diamater Study Group*”, sob a orientação da Profa. Emérita Marilza Rudge e coorientação da Profa. Dra. Angélica Barbosa e do Dr. David Reyes.

No decorrer do ano, além de dar seguimento ao meu projeto, participei de eventos internacionais (Anexo 1), como “*Diabetes, Obesity and Pregnancy Outcomes*”, “*Obesity Inflammasome as a Risk for Developing Gestational Diabetes*” e “*Placental Adaptation in Gestational Diabetes and Obesity*” e fui contemplada com uma bolsa Treinamento Técnico 3 (TT3) da FAPESP (Anexo 2), com o projeto intitulado: “Treino e aperfeiçoamento na execução do preparo e análise da contratilidade *ex vivo* do músculo reto abdominal de gestantes”, sob orientação da Profa. Emérita Marilza Rudge.

Foi possível ainda colaborar em 4 artigos, sendo um publicado e demais em fase de submissão para revistas de alto impacto.

Artigo publicado: *Effectiveness of the pelvic floor muscle training on muscular dysfunction and pregnant specific urinary incontinence in pregnant women with gestational diabetes mellitus: A systematic review protocol* (Anexo 3).

Tenho o intuito de concluir o mestrado, continuar me aperfeiçoando e adquirir conhecimento constante pensando nos benefícios para a saúde das mulheres. Além disso, almejo fazer a diferença no cenário acadêmico e científico, dando continuidade aos estudos por meio do Doutorado.

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Matrix – What Do We Know About Its Composition, Regulation, and Physiological Roles? A Narrative Review. *Front Physiol.* 2020;11(March):1–15.

ABSTRACT

Introduction: Pregnancy-Specific Urinary Incontinence (PSUI) is a predictor variable of long-term UI. We have previously demonstrated that Rectus Abdominis Muscle (RAM) myopathy is the underlie mechanism. Selective *ex vivo* myo-mechanical assay (MMA) of RAM is unknown in healthy pregnant women with PSUI. **Aims:** Understand the relationship between PSUI and continent pregnant women with normal glucose tolerance and explore an established protocol for qualitative and quantitative peak and graph analysis of fresh RAM samples acquired at C-section from mothers with normal glucose tolerance with and without (the control group) PSUI, applying *ex vivo* myography. **Method:** A cross-sectional study nested within a cohort was performed using *ex vivo* myography assay in 87 mothers with normal glucose tolerance with (n= 48) and without (n = 39) PSUI. General data were extracted from database. RAM samples were collected at C-section for *ex vivo* myography qualitative and quantitative analysis (initial baseline, final baseline, peak, strength, and duration time). Statistical analysis: Continuous variable results were expressed as mean and standard deviation and categories by number and percentage (%). **Results:** We found no overall specific quantitative parameters of window analysis and contractile response of RAM *ex vivo* MMA. A progressive and continuous decline was mostly confined to the peak and strength in both groups. Qualitative contractile response of RAM *ex vivo* MMA using peak and strength parameters allow us to demonstrate three behaviors of contractile response of RAM under electrical stimulation: progressive decrease in strength; sudden muscular arrest and asynchrony (disorderly; messy) register with ups and downs. **Conclusion:** Deep quantitative analysis of RAM *ex vivo* analysis did not benefit the results to differentiate both groups. Qualitative analysis improved the differentiation between both groups by demonstrating a tendency of loss the progressive fall of the peaks observed in control group.

Keywords – pregnancy; urinary incontinence; rectus abdominis muscle; myography; *ex vivo* analysis.

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