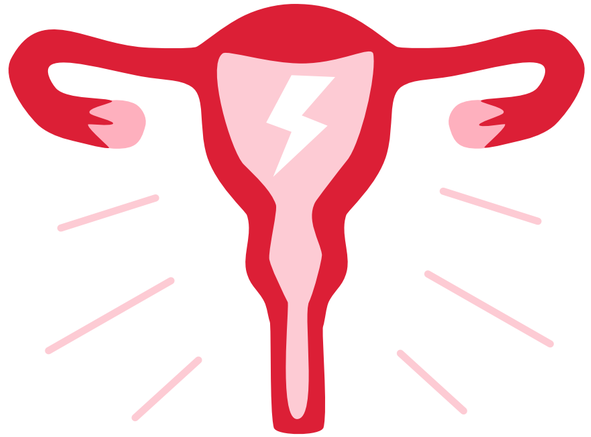
GRUPO 5

CÓLICOS MENSTRUALES

EMG



INTRODUCCIÓN

Afecta entre

50%-90%

mujeres [1]

Dismenorrea

Abdomen Nauseas [2, 3]

Cabeza Piernas

Espalda Diarreas

Estrenimiento

Primaria

Sin patologia [4]

Secundaria

Endometriosis, Adenomiosis

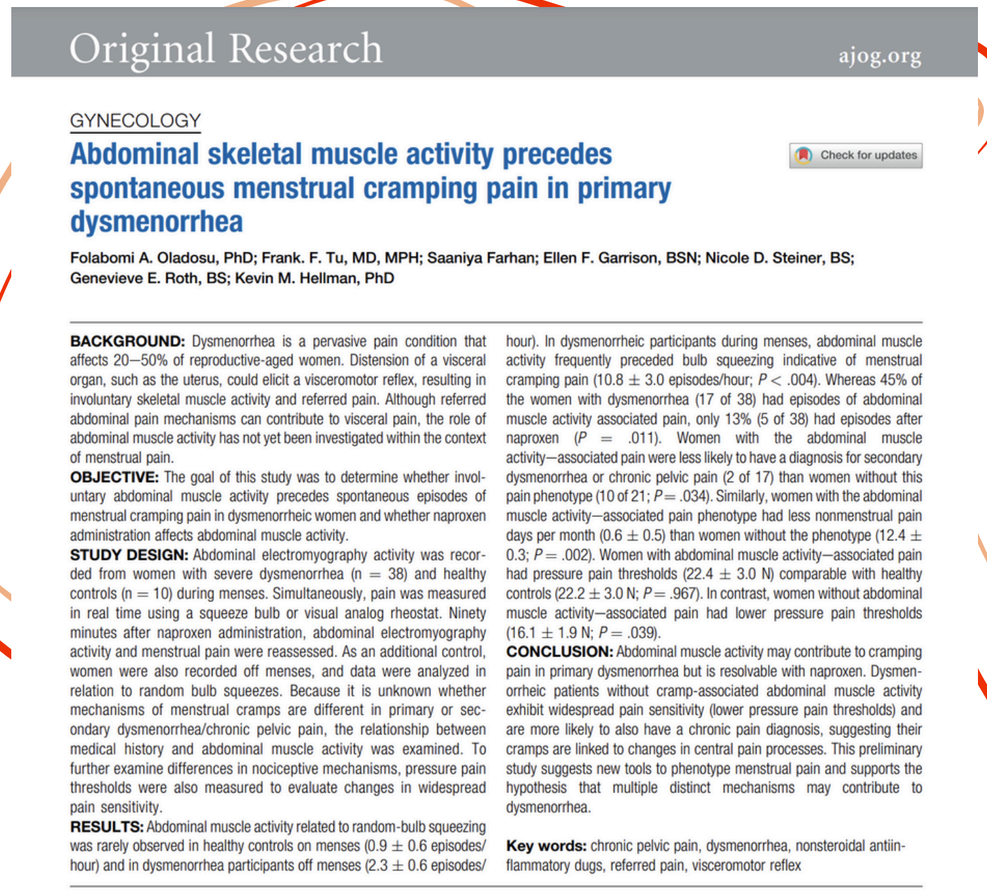
VMR [5]

reflejos visceromotores → **EMG**

Información extendida: bit.ly/EMG_dismenorrea

ESTADO DEL ARTE

La actividad del músculo esquelético abdominal precede al dolor menstrual espontáneo en la dismenorrea primaria [5]



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GYNECOLOGY

Abdominal skeletal muscle activity precedes spontaneous menstrual cramping pain in primary dysmenorrhea

Check for updates

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BACKGROUND: Dysmenorrhea is a pervasive pain condition that affects 20–50% of reproductive-aged women. Distension of a visceral organ, such as the uterus, could elicit a visceromotor reflex, resulting in involuntary skeletal muscle activity and referred pain. Although referred abdominal pain mechanisms can contribute to visceral pain, the role of abdominal muscle activity has not yet been investigated within the context of menstrual pain.

OBJECTIVE: The goal of this study was to determine whether involuntary abdominal muscle activity precedes spontaneous episodes of menstrual cramping pain in dysmenorrheic women and whether naproxen administration affects abdominal muscle activity.

STUDY DESIGN: Abdominal electromyography activity was recorded from women with severe dysmenorrhea (n = 38) and healthy controls (n = 10) during menses. Simultaneously, pain was measured in real time using a squeeze bulb or visual analog rheostat. Ninety minutes after naproxen administration, abdominal electromyography activity and menstrual pain were reassessed. As an additional control, women were also recorded off menses, and data were analyzed in relation to random bulb squeezes. Because it is unknown whether mechanisms of menstrual cramps are different in primary or secondary dysmenorrhea/chronic pelvic pain, the relationship between medical history and abdominal muscle activity was examined. To further examine differences in nociceptive mechanisms, pressure pain thresholds were also measured to evaluate changes in widespread pain sensitivity.

RESULTS: Abdominal muscle activity related to random-bulb squeezing was rarely observed in healthy controls on menses (0.9 ± 0.6 episodes/hour) and in dysmenorrhea participants off menses (2.3 ± 0.6 episodes/hour). In dysmenorrheic participants during menses, abdominal muscle activity frequently preceded bulb squeezing indicative of menstrual cramping pain (10.8 ± 3.0 episodes/hour; $P < .004$). Whereas 45% of the women with dysmenorrhea (17 of 38) had episodes of abdominal muscle activity associated pain, only 13% (5 of 38) had episodes after naproxen ($P = .011$). Women with the abdominal muscle activity–associated pain were less likely to have a diagnosis for secondary dysmenorrhea or chronic pelvic pain (2 of 17) than women without this pain phenotype (10 of 21; $P = .034$). Similarly, women with the abdominal muscle activity–associated pain phenotype had less nonmenstrual pain days per month (0.6 ± 0.5) than women without the phenotype (12.4 ± 0.3; $P = .002$). Women with abdominal muscle activity–associated pain had pressure pain thresholds (22.4 ± 3.0 N) comparable with healthy controls (22.2 ± 3.0 N; $P = .967$). In contrast, women without abdominal muscle activity–associated pain had lower pressure pain thresholds (16.1 ± 1.9 N; $P = .039$).

CONCLUSION: Abdominal muscle activity may contribute to cramping pain in primary dysmenorrhea but is resolvable with naproxen. Dysmenorrheic patients without cramp-associated abdominal muscle activity exhibit widespread pain sensitivity (lower pressure pain thresholds) and are more likely to also have a chronic pain diagnosis, suggesting their cramps are linked to changes in central pain processes. This preliminary study suggests new tools to phenotype menstrual pain and supports the hypothesis that multiple distinct mechanisms may contribute to dysmenorrhea.

Key words: chronic pelvic pain, dysmenorrhea, nonsteroidal antiinflammatory dugs, referred pain, visceromotor reflex

- Distensión del útero puede provocar un **reflejo visceromotor** que da lugar a una **actividad involuntaria de los músculos esqueléticos** y dolor.

- **Objetivo del estudio:** determinar si la actividad muscular abdominal involuntatia precede a los episodios espontáneos de dolor menstrual en mujeres dismorreicas. Se registró actividad abdominal a 38 mujeres con dismenorrea grave.

- Ubicación de **electrodos EMG estándar:**
  - 1 entre el ombligo y hueso púbico
  - 2 electrodos a 4-6 cm lateralmente y 2 cm por encima del ombligo
  - 1 electrodo a 4 cm por debajo de uno de los electrodos anteriores

ESTADO DEL ARTE

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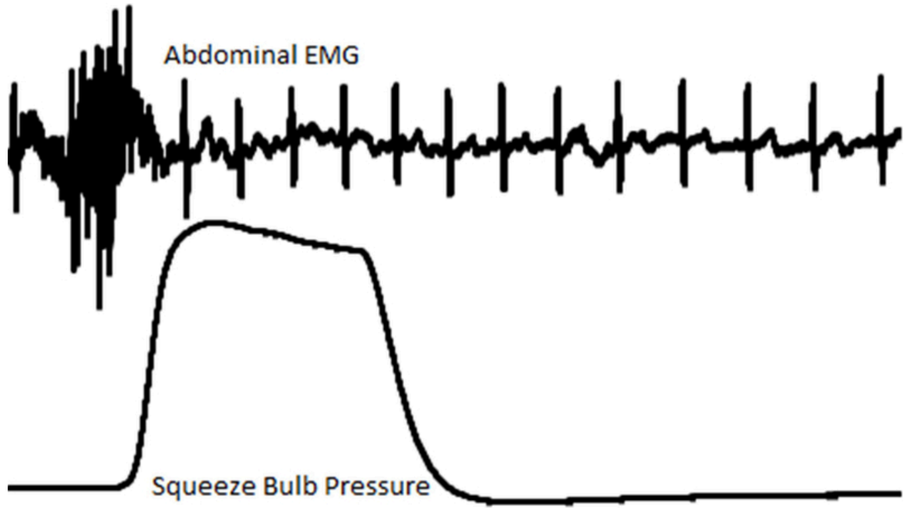
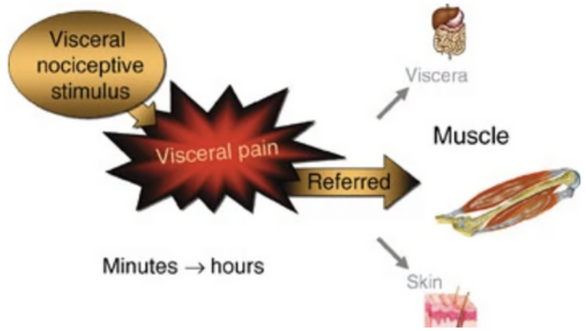


Fig. 1: Reflejo víscero-motor: actividad muscular abdominal que precede a un calambre menstrual.

- Se filtró entre 100 y 250 Hz para aislar la actividad muscular abdominal.

- **Resultados:**
  - 45% de las mujeres con dismenorrea tuvieron episodios de dolor asociado con la actividad muscular abdominal.
  - **Actividad EMG precedió a episodios de calambre en promedio 10.8 ± 3.0 veces por hora en participantes con dismenorrea durante su menstruación.**

Squeeze bulb pressure: las mujeres del estudio aprietan una pera de presión cuando sienten dolor de calambres



Reflejo viscerosomático

ESTADO DEL ARTE

The Prevalence and Risk Factors of Dysmenorrhea [6]

“The definition of dysmenorrhea varied from abdominal or low back pain or cramps of any severity during menstrual bleeding in the previous month to the past 12 months gathered through self-reporting, interview, or daily diary recording. The majority of studies did not limit the severity of pain or distinguish between the types of dysmenorrhea, such as primary or secondary dysmenorrhea.”

Soluciones actuales

Warmies® Stuffed Animals

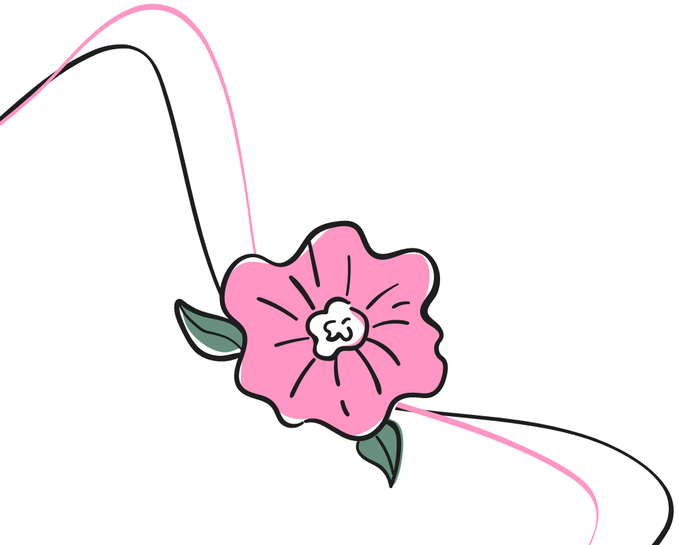
Medicación (dolor agudo o crónico)

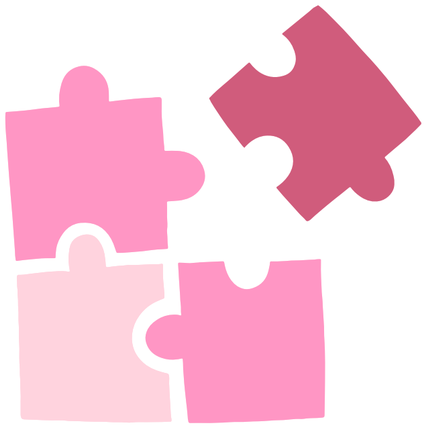
PROBLEMÁTICA

La dismenorrea es una afección que la mayoría de las mujeres sufren en la edad reproductiva, especialmente aquellas que padecen de alteraciones como el síndrome de ovario poliquístico (SOP) y endometriosis, lo que afecta significativamente su calidad de vida. Existe una carencia de estudios que analicen la señal electromiográfica (EMG) generada por los cólicos menstruales y su relación con la actividad de los músculos abdominales y lumbares. Esta falta de investigación limita nuestra capacidad para distinguir de manera precisa las señales eléctricas asociadas a los episodios de cólicos menstruales y su relación con los músculos subyacentes. Diferenciar estas señales da la posibilidad de desarrollar soluciones eficaces.

PROPUESTA DE SOLUCIÓN

Este trabajo tiene como objetivo analizar las señales EMG obtenidas de los músculos relevantes en pacientes con dismenorrea, tanto abdominales como de espalda baja, con el fin de identificar patrones de actividad que puedan explicar los mecanismos subyacentes del dolor menstrual. El análisis de estas señales no solo permitirá una mejor comprensión del dolor menstrual, sino que también podría abrir nuevas vías para el tratamiento y manejo personalizado de la dismenorrea.





BASE DE DATOS

Opción 1:

Base de datos:
EHG (electrohisterograma) señales eléctricas en el músculo uterino.

Permite analizar:

- Número de contracciones
- Duración de la contracción
- Amplitud y potencia de la contracción

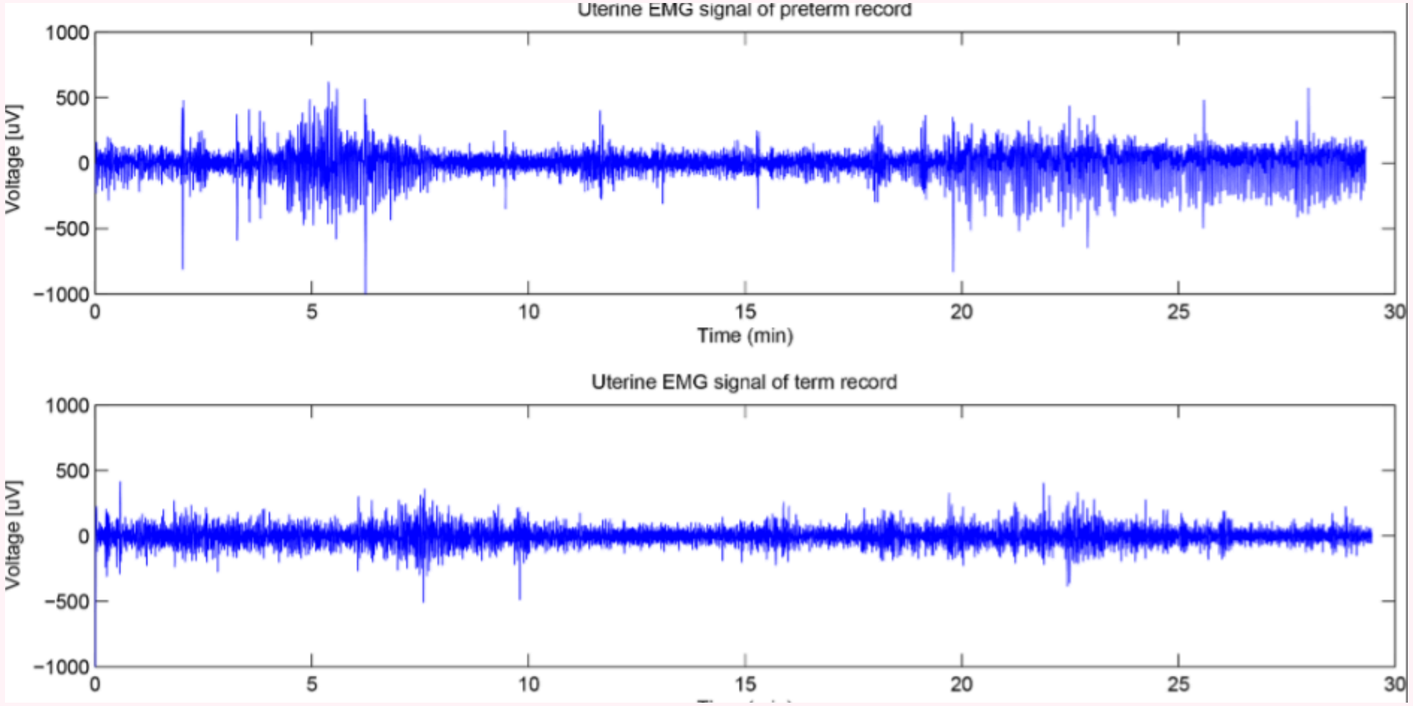


Fig. 2: Examples of raw uterine EMG signal records [2]

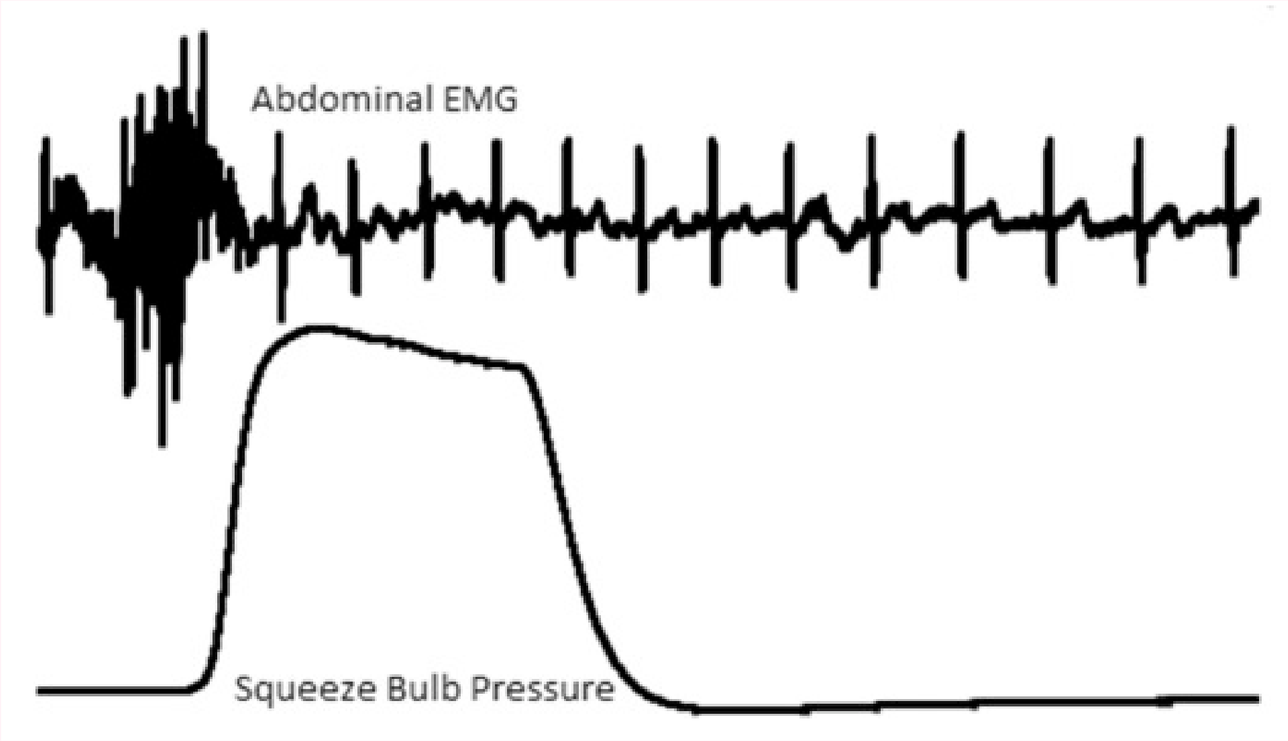
Links:

- https://physionet.org/content/tpehgdb/1.0.1/
- https://www.physionet.org/content/tpehgt/1.0.0/

BASE DE DATOS

Opción 2:

Solicitar base de datos a estudio de análisis de EMG de actividad muscular del abdomen en cólicos por dismenorrea



Link: https://www.sciencedirect.com/science/article/pii/S0002937818303818#sec3

REFERENCIAS

[1] McKenna KA;Fogleman CD, “Dysmenorrhea,” American family physician, vol. 104, no. 2, 2021, Accessed: Sep. 09, 2024. [Online]. Available: https://pubmed.ncbi.nlm.nih.gov/34383437/

[2] “Dysmenorrhea: Menstrual Cramps, Causes & Treatments,” Cleveland Clinic, Mar. 14, 2017. https://my.clevelandclinic.org/health/diseases/4148-dysmenorrhea.

[3] J. V. Pinkerton, “Cólicos menstruales,” Manual MSD versión para público general, Feb. 06, 2023. https://www.msdmanuals.com/es-pe/hogar/salud-femenina/trastornos-menstruales-y-sangrados-vaginales-an%C3%B3malos/c%C3%B3licos-menstruales

[4] “Assessment of dysmenorrhoea - Differential diagnosis of symptoms | BMJ Best Practice,” Bmj.com, 2024. https://bestpractice.bmj.com//topics/en-gb/420

[5] F. A. Oladosu et al., “Abdominal skeletal muscle activity precedes spontaneous menstrual cramping pain in primary dysmenorrhea,” American Journal of Obstetrics and Gynecology, vol. 219, no. 1, pp. 91.e1–91.e7, Jul. 2018, doi: https://doi.org/10.1016/j.ajog.2018.04.050.

[6] Hong Ju, Mark Jones, Gita Mishra, The Prevalence and Risk Factors of Dysmenorrhea, Epidemiologic Reviews, Volume 36, Issue 1, 2014, Pages 104–113

[7] P. Ren, S. Yao, J. Li, P. A. Valdes-Sosa, and K. M. Kendrick, “Improved Prediction of Preterm Delivery Using Empirical Mode Decomposition Analysis of Uterine Electromyography Signals,” PLoS ONE, vol. 10, no. 7, pp. e0132116–e0132116, Jul. 2015, doi: https://doi.org/10.1371/journal.pone.0132116.