The evaluation of progesterone and dysmenorrhea levels after the manual therapy in young women in relation to the use of nonsteroidal anti-inflammatory drugs

Zofia Barcikowska [1] , Mgdalena Emilia Grzybowska [2] , Elżbieta Rajkowska-Labon [3] , Rita Hansdorfer-Korzon [4] , Katarzyna Zorena [5]

[1]Department of Immunobiology and Environment Microbiology, Medical University of Gdańsk, Dębinki 7, 80-211 Gdańsk, Poland, email: zofia.barcikowska@gumed.edu.pl
[2]Department of Gynecology, Gynecologic Oncology and Gynecologic Endocrinology, Medical University of Gdańsk, Smoluchowskiego 17, 80-214 Gdańsk, Poland, email: mlgrzybowska@wp.pl
[3]Department of Physical Therapy, Medical University of Gdańsk, Dębinki 7, 80-211 Gdańsk, Poland, email: erlabon@gumed.edu.pl
[4]Department of Physical Therapy, Medical University of Gdańsk, Dębinki 7, 80-211 Gdańsk, Poland; email: rita.hansdorfer-korzon@gumed.edu.pl
[5]Department of Immunobiology and Environment Microbiology, Medical University of Gdańsk, Dębinki 7, 80-211 Gdańsk, Poland, email: kzorena@gumed.edu.pl

Dysmenorrhea

- Despite numerous studies, the pathomechanism of dysmenorrhea is not fully understood.
- Previous studies have shown that dysmenorrhea is a complex process that may depend on many factors [1,2].
- It is known that susceptibility to dysmenorrhea may be associated with genetic factors with an elevated secretion of prostaglandins and hormones such as estrogen and progesterone [2-5].

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2. Barcikowska, Z.; Wójcik-Bilkiewicz, K.; Sobierajska-Rek, A.; Grzybowska, M. E.; Wąż, P.; Zorena, K. Dysmenorrhea and Associated Factors among Polish Women: A Cross-Sectional Study. Pain Res. Manag.2020,
3. H. Y. Dogru, A. Z. Ozsoy, N. Karakus, I. B. Delibas, C. K. Isguder, and S. Yigit, "Association of genetic poly- morphisms in TNF and MIF gene with the risk of primary dysmenorrhea," Biochemical Genetics, vol. 54, no. 4, pp. 457–466, 2016.
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5. A. V. Jones, J. R. F. Hockley, C. Hyde et al., "Genome-wide association analysis of pain severity in dysmenorrhea identifies association at chromosome 1p13.2, near the nerve growth factor locus," Pain, vol. 157, no. 11, pp. 2571–2581, 2016.

Factors associated with dysmenorrhea

Our recent research has shown that women with dysmenorrhea were characterized with:

- occurrence of premenstrual syndrome (PMS),
- early age of menarche
- family history of dysmenorrhea
- stressful lifestyle
- lack of physical activity
- low self-esteem

Research Article

Dysmenorrhea and Associated Factors among Polish Women: A Cross-Sectional Study

Zofia Barcikowska,[1] **Karolina Wójcik-Bilkiewicz**,[2] **Agnieszka Sobierajska-Rek**,[3] **Magdalena Emilia Grzybowska**,[4] **Piotr Wąż**,[5] **and Katarzyna Zorena**[1]

[1]*Department of Immunobiology and Environment Microbiology, Medical University of Gdańsk, Dębinki 7, 80-211, Gdańsk, Poland*
[2]*Department of Clinical Anatomy, Medical University of Gdańsk, Dębinki 1, 80-211, Gdańsk, Poland*
[3]*Department of Rehabilitation Medicine, Medical University of Gdańsk, Al. Zwycięstwa 30, 80-219, Gdańsk, Poland*
[4]*Department of Gynecology, Gynecological Oncology and Gynecological Endocrinology, Medical University of Gdańsk, Smoluchowskiego 17, 80-214, Gdańsk, Poland*
[5]*Department of Nuclear Medicine, Medical University of Gdańsk, Tuwima 15, 80-210, Gdańsk, Poland*

Correspondence should be addressed to Zofia Barcikowska; zofia.barcikowska@gumed.edu.pl

Early age of menarche

Our study showed that the age of the first menstruation had a significant relationship to the occurrence of dysmenorrhea. As many as 48% of the respondents had their first menstruation at the age of ≤12.

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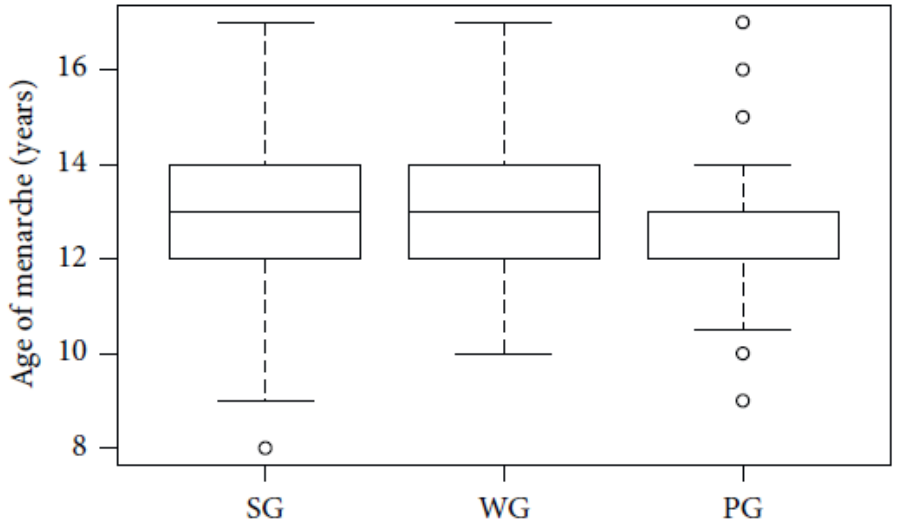

FIGURE 5: Age of the first menstruation and dysmenorrhea in respondents. A statistically significant difference was revealed between the PG and SG groups ($p = 0.011$), as well as between the PG and WG ($p = 0.002$), and between the WG and SG ($p = 0.045$). PG, women with dysmenorrhea during every cycle, SG, women with dysmenorrhea occasionally, and WG, women without dysmenorrhea.

Barcikowska, Z.; Wójcik-Bilkiewicz, K.; Sobierajska-Rek, A.; Grzybowska, M. E.; Wąż, P.; Zorena, K. Dysmenorrhea and Associated Factors among Polish Women: A Cross-Sectional Study. Pain Res. Manag.2020, 2020.

Family history of dysmenorrhea

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In addition, it was shown that dysmenorrhea was most likely to occur in respondents whose mothers and sisters had a history of dysmenorrhea.

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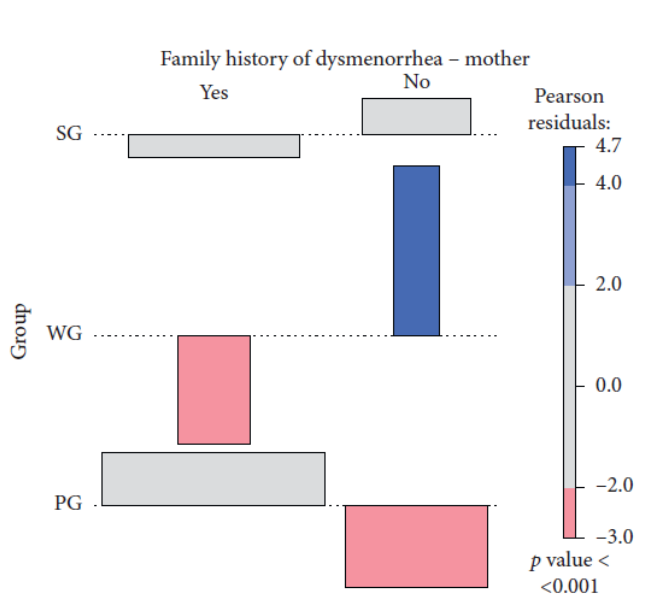

FIGURE 1: A diagram of multidimensional data association for respondents from the groups (PG, SG, and WG) and the occurrence of dysmenorrhea in the respondents' mothers (answers: yes, no). A significant statistical relationship $p < 0.001$ was found between the multidimensional data. PG, women with dysmenorrhea during every cycle, SG, women with dysmenorrhea occasionally, and WG, women without dysmenorrhea.

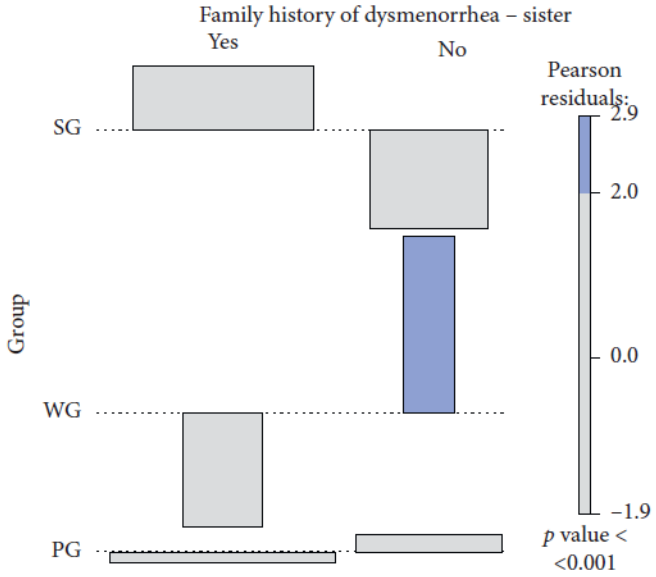

FIGURE 2: A diagram of multidimensional data association for respondents from individual groups (PG, SG, and WG) and the occurrence of dysmenorrhea in sisters of the respondents (answers: yes, no). A significant statistical relationship $p < 0.001$ was found between the multidimensional data. PG, women with dysmenorrhea during every cycle, SG, women with dysmenorrhea occasionally, and WG, women without dysmenorrhea.

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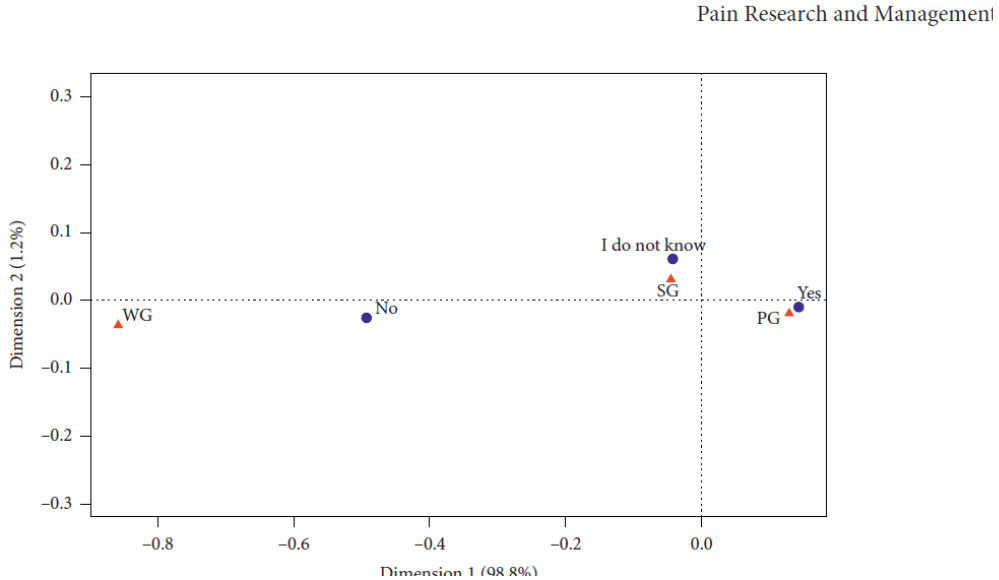
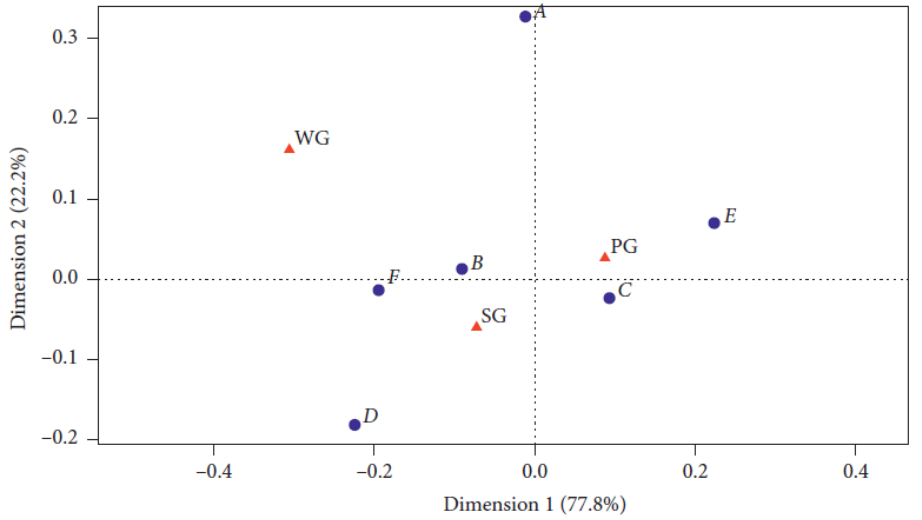
Occurrence of premenstrual syndrome (PMS) and low self-esteem

Our research demonstrates that the prevalence of PMS was significantly higher in the women with dysmenorrhea. Premenstrual syndrome was detected in 83.8% of women with dysmenorrhea and only in 39.3% of women who had not reported dysmenorrhea



We have shown a significant relationship between the answer "I think I am ugly, I cannot look at myself" and the occurrence of dysmenorrhea.



A - I am perfect, I love my appearance
B - I accept myself as I am, although I am aware of my imperfections
C - When I have a good day I don't have much to complain about, but sometimes I feel worse about myself
D - It doesn't matter how I look – I don't care
E - think I'm ugly, I can't look at myself
F - Others

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Treatment options of dysmenorrhea

- Management approaches for primary dysmenorrhea consist of pharmacological as well as non-pharmacological methods [6-9].
- Pharmacological interventions may not be completely effective, and have undesirable side effects for about 15% of females with primary dysmenorrheal [6].
- Non-pharmacological interventions have been suggested for attaining relief from dysmenorrhea symptoms, including acupuncture and acupressure, biofeedback, heat management, transcutaneous electrical nerve stimulation, and relaxation techniques [7,9]

6. Rizk, S. A. Effect of Aromatherapy Abdominal Massage using Peppermint Versus Ginger oils on Primary Dysmenorrhea among Adolescent Girls. *Journal of American Science J Am Sci*, **2013**, 99(1111), 597–605.
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Treatment options of dysmenorrhea

- However, research is still needed to fully understand both the causes of dysmenorrhea and the methods of prevention.
- The use of manual therapy may be one of the additional forms of non-pharmacological support in the treatment of painful periods in young women.
- The manual therapy is „skilled hand movements intended to produce any or all of the following effects: improve tissue extensibility; increase range of motion of the joint complex; mobilize or manipulate soft tissues and joints; induce relaxation; change muscle function; modulate pain; and reduce soft tissue swelling, inflammation or movement restriction." *(The International Federation of Orthopaedic Manipulative Physical Therapists)*

Aim of the study

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The study was aimed at evaluating the levels of progesterone and 17-beta oestradiol, and the severity of dysmenorrhea in six young women, including three after the use of manual therapy and the other three after the administration of ibuprofen.

Materials and methods

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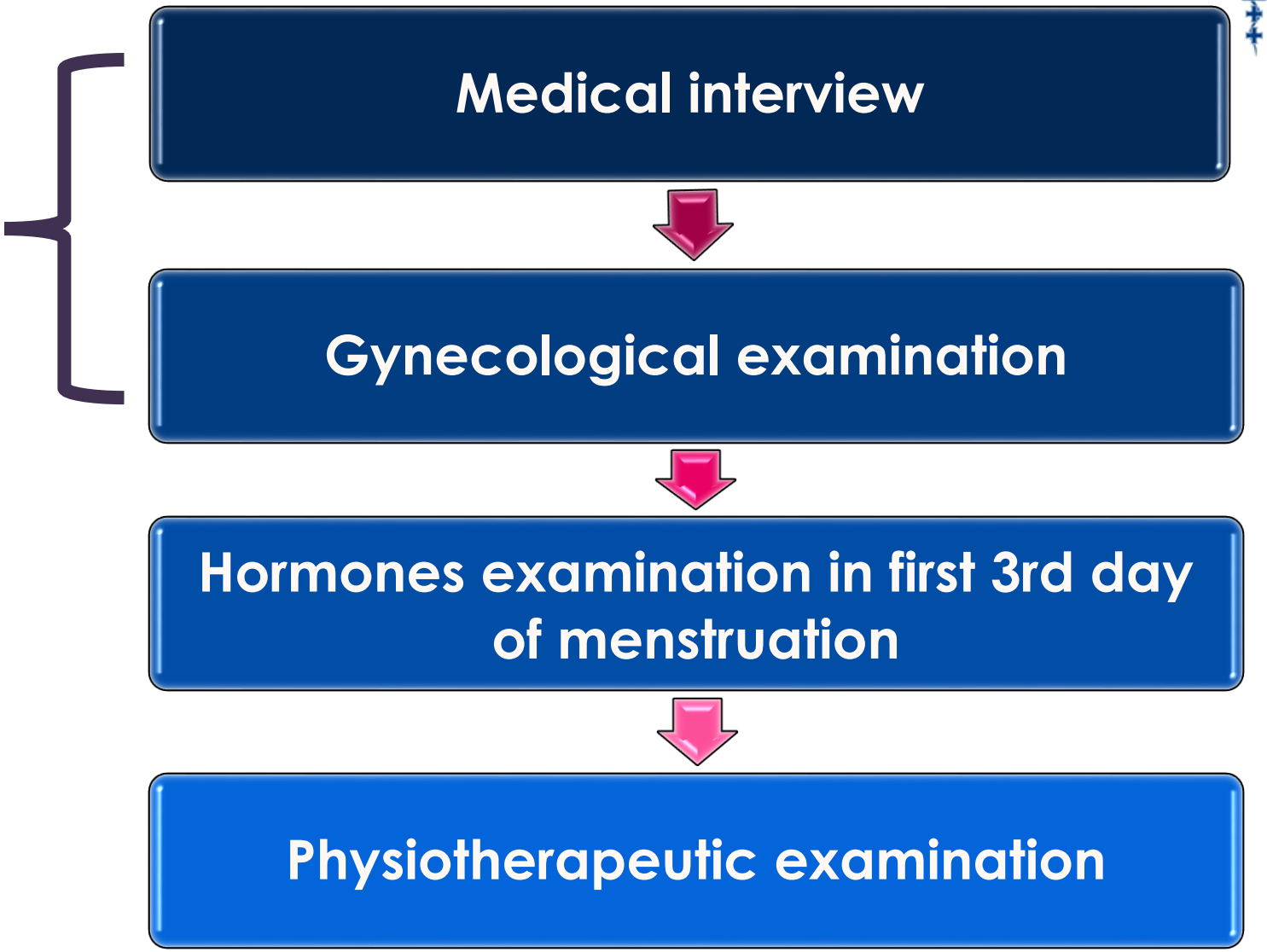
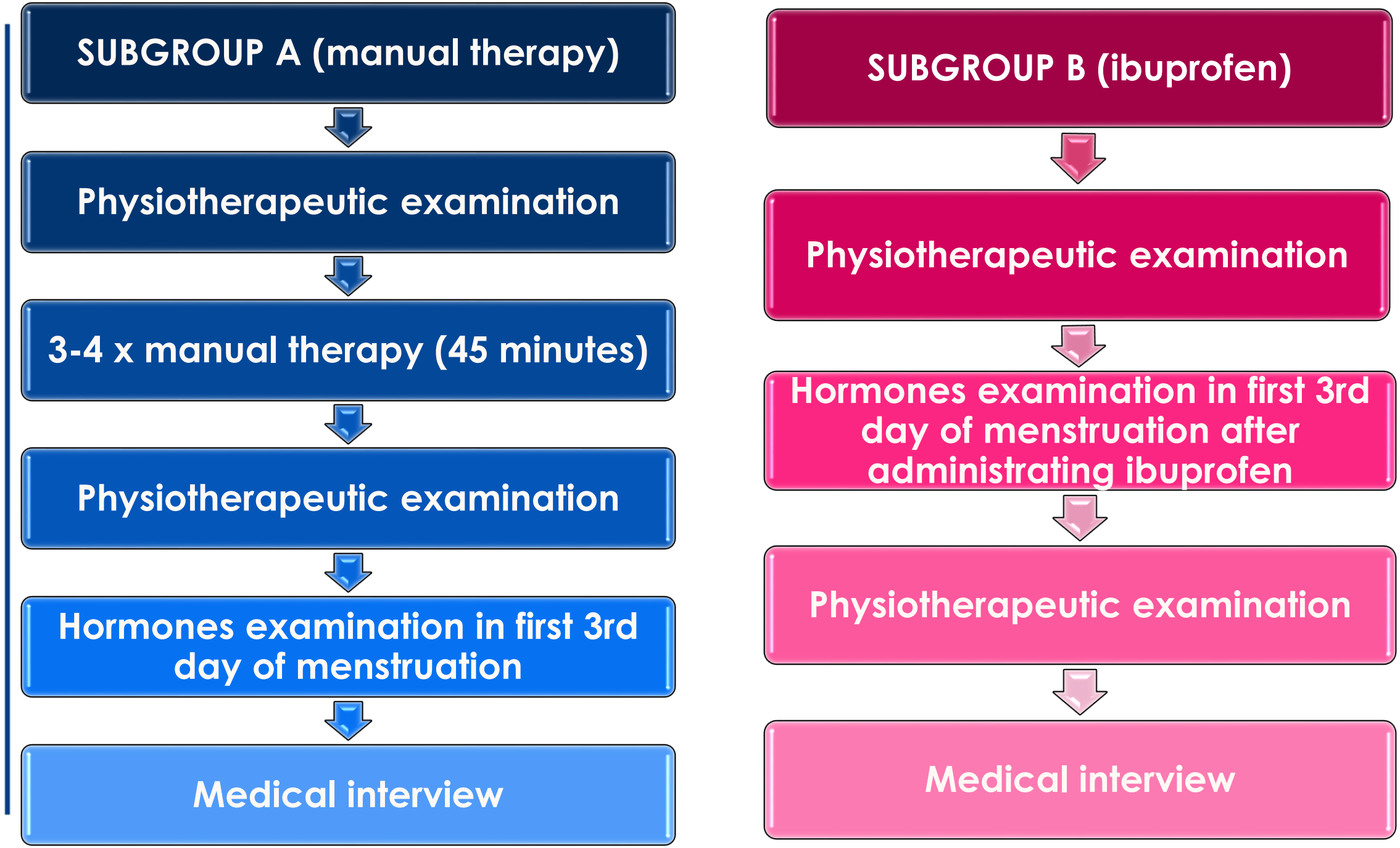
- A study was conducted in **six women with dysmenorrhea**, **mean aged 22 ± 2 years**. Women was recruited to study in 2019-2020. The women was qualified by original questionnaire, gynecological and physiotherapeutic examination.
  - The questionnaire includes inclusion and exclusion criteria
  - Gynecological examination consist of standard gynecological examination and USG
- Women was divided to two equal subgroups: subgroup A (manual therapy) and subgroup B (administation of ibuprofen)
  - **In subgroup A** (n=3) was conducted **manual therapy** (3 meetings, duration time: 45 minutes). Manual therapy consist of a diaphragm stretching, manual release of pelvic floor muscles, poizometric relaxation of muscles and trigger points manual therapy according to Simons and Travell of selected muscles
  - **In subgroup B** (n=3) patients taken **ibuprofen** in dose 3 x 4oo mg per day during dysmenorrhea

Materials and methods

- Pain severity among women with dysmenorrhea was assessed with the use of the Numeric Pain Rating Scale (NPRS).
- Progesterone and 17-beta oestradiol levels were measured by using of Electrochemiluminescence in external laboratory.
- The study was approved by the Ethics Committee of the Medical University of Gdańsk (no NKBBN/475/2018) and the investigation was carried out in accordance with the principles of the Declaration of Helsinki as revised in 1996.

Qualification to the study




SUBGROUP A (manual therapy)
Physiotherapeutic examination
3-4 x manual therapy (45 minutes)
Physiotherapeutic examination
Hormones examination in first 3rd day of menstruation
Medical interview
SUBGROUP B (ibuprofen)
Physiotherapeutic examination
Hormones examination in first 3rd day of menstruation after administrating ibuprofen
Physiotherapeutic examination
Medical interview

Results

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	The young women with dysmenorrhea			
	Subgroup A		Subgroup B	
Age (years)	22		21	
Body Mass Index (kg/m^2)	21		24	
Manual therapy (3 x 45 min)	YES		NO	
Administered ibuprofen 3 x 400 mg/24 h	NO		YES	
	Pre (mean)	Post (mean)	Pre (mean)	Post (mean)
Progesterone (ng/ml)	0.41	0.30	0.31	0.27
17-beta oestradiol (pg/ml)	28.0	36.3	27.0	17.0
Numerical pain rating scale (NPRS)	8	3	8	3
Duration of dysmenorrhea (days)	2	1	3	3

Conclusions

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1. The use of manual therapy in women could relieve dysmenorrhea to a similar degree as ibuprofen.
2. However, only the manual therapy exerted an effect on the shortening of dysmenorrhea duration time in the surveyed women.
3. Moreover, manual therapy probably influenced the diminution of progesterone level in young women with dysmenorrhea.
4. Further studies using a greater number of patients are required.

Thank you for your attention.