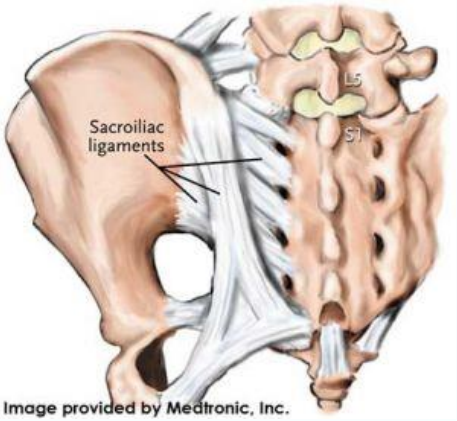


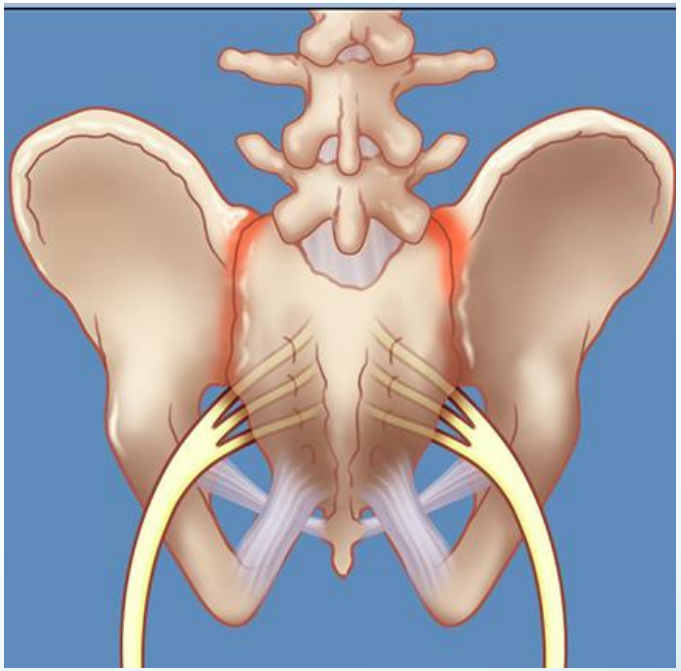
Sacroiliac dysfunction

SI joint (pain) syndrome, SI joint sprain, or Sacroiliitis

Ratko Matijevic

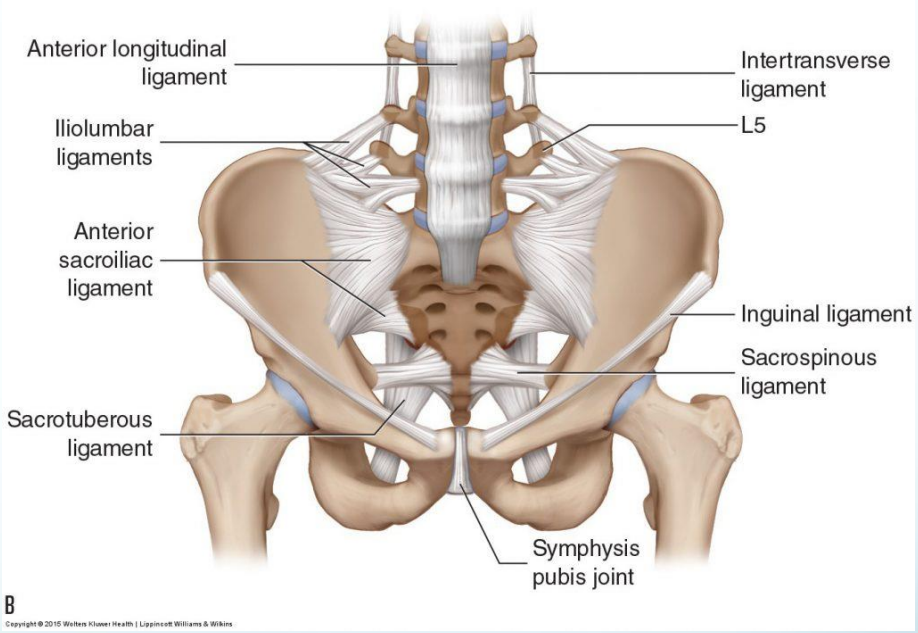
Definition

- pain in or around the region of the sacroiliac joint
- due to misalignment, abnormal movement, or trauma to the area
- pain between the posterior superior iliac spine and gluteal folds, particularly close to the sacroiliac joints
- main cause of pain in the lower part of the back
- the incidence from 14% to 75% during pregnancy



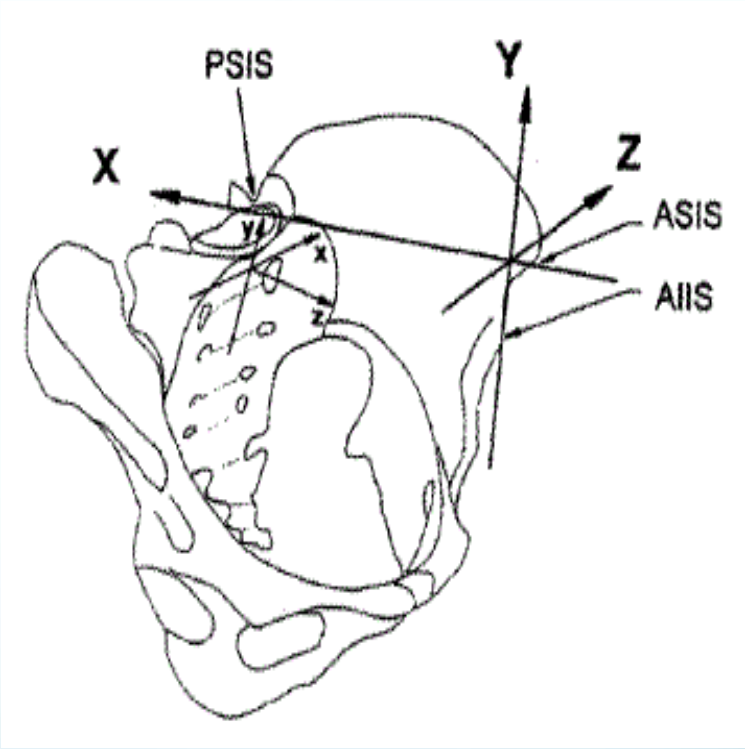
Anatomy of SI joints

- Small joint that lies at the junction of the sacrum and the ilium.
- 2 IS ligaments
  - Anterior and posterior
- Little mobility
- Transfers load from upper body to the lower body.
- Provides shock absorption for the spine



SI joint motion

Three axes for angular and translational motion of innominate relative to the sacral segment (Hungerford et al., 2004)



- Multi-planar motion (<4° in any plane)

  Nutation / Counter nutation

  Males: 1 - 2° Females: 2 – 4°

- Sacral Translation (A-P motion) up to 1.6mm

Etiology

- SID during pregnancy is influenced by biomechanical and hormonal factors.
- Constant uterine growth is the main cause of changes in statics and dynamics during pregnancy.
  - The uterus moves proximal, anterior and lateral, changing the centre of gravity posteriorly and distally
  - anterior pelvic tilt and lumbar lordosis increase.

  increase in the pressure on the lumbosacral spine and the sacroiliac joints and the occurrence of sacroiliac dysfunction in pregnancy.
- Increasing hormone levels of relaxin and estrogen leads to ligamentous laxity, cartilage softening and proliferation of synovial fluid, which increases the load on the sacroiliac joints and causes a reduction in support and instability of the pelvis.

Etiology (also)

- The causes of SID are multifactorial and often there is an obvious explanation
- SID is more likely to be a combination of factors that include:
  - The sacroiliac joints moving asymmetrically
  - Abnormal pelvic girdle biomechanics from altered activity in the spinal, abdominal, pelvic girdle, hip and pelvic floor muscles
- A small member of women may have non biomechanical but hormonally- induced pain in the pelvic girdle. Occasionally the position of the baby may produce SID.

Symptoms and signs

Pain is key – from minimal discomfort to severe disability

Dull ache, sharp, or stabbing
Distribution to the buttocks, back of thigh, and lower back
Unilateral or bilateral
Worse

When sitting for long periods of time
When performing twisting/rotary motions

Morning stiffness
Resolves with exercise, depending on pain.
Pain over PSIS

Symptoms and signs

Difficulty walking (waddling gait)

Pain on weight bearing on one leg I.e. climbing stairs, dressing)

Pain and/or difficulty in straddle movements e.g. getting in and out of bath, turning in bed

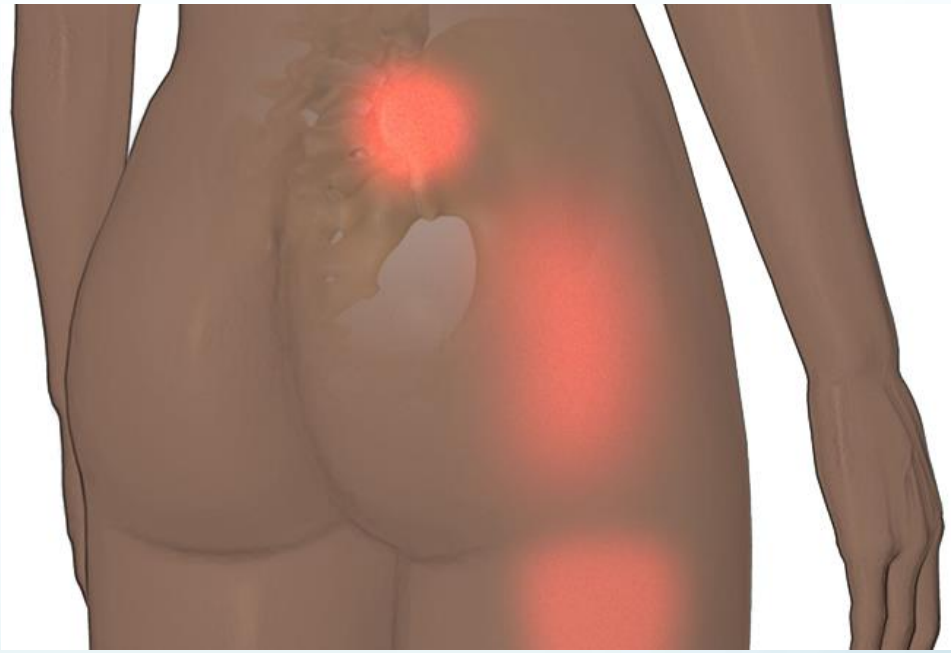
Clicking or grinding in pelvic area may be audible or palpable

Limited and pain full hip abduction

difficulty lying in some positions e.g. supine – side lying

Pain during normal activities of daily life

Pain and difficulty during sexual intercourse



The effect of SID

- Facilitatate parturition (giving birth)
- SID:
  - reduction in activity in pregnancy (which increases the risk of varicose veins, deep vein thrombosis, weight gain, muscle reduction, etc.)
  - limitations in everyday activities, social and sex life
  - inability to professional work and a hobby that affects the quality of life of a pregnant woman
  - difficulty in labour and the inability to care for the child in the postpartum period.

Prognosis

- Symptoms of SID are reduced by 93% of pregnant women within three months postpartum
- Symptoms may last even 6 – 12 months postpartum in 1% to 2% of patients
- mainly in pregnant women who experienced intense pain and severe disability during pregnancy.
- Recurrence of SID is common in the following pregnancy (41% to 77%) .

Risk factors

- History of previous LBP
- History of previous trauma to the pelvis
- multiparty
- Poor work place ergonomics and awkward working conditions
- General joint hyper mobility

Diagnosis

- 3 of 5 positive clinical tests provides discriminative power for diagnosing SID

Szadek – J Pain 2009, Laslett – J Man Manip Ther 2008 European guidelines - (Vleeming et al.,2008).

Patrick FABER test

- Flexion, abduction and external rotation
- Se=0,70;Sp=0,99;P=0,62

4P (posterior pelvic pain provocation) test

- Thigh thrust provocative test
- Se=0,93;Sp=0,98;P=0,70
- Axial pressure along the length of the femur
- To distinguish between pelvic girgle pain and LBP

Distraction test

- Pressure on superior anterior iliac spines
- Se=0,60;Sp=81;P=0,84

Manipulation test (pubic)

- Pressure over pubic bone
- O=0,81;S=0,99;P=0,89

Sacral thrust test (modified)

- O=0,63;S=0,75;P=0,76
- Not on the stomach, left lateral
- Pressure on SI joints

The best

Management options

Muscule Energy Techniques

Joint Mobilization Techniques

Stretching Technoues

Sternthening Techniques

Dynamic Lumbar Stabilization

Study 1

- Incidence, pain and mobility assessment of pregnant women with sacroiliac dysfunction

Int J Gynaecol Obstet. 2018 Sep;142(3):283-287. doi: 10.1002/ijgo.12560. Epub 2018 Jun 25.

Incidence, pain, and mobility assessment of pregnant women with sacroiliac dysfunction.

Filipec M[1], Jadanec M[1], Kostovic-Srzentic M[2], van der Vaart H[3], Matijevic R[4,5].

Author information

Abstract

OBJECTIVES: To determine the incidence of sacroiliac dysfunction in pregnancy and assess its progress during the course of the pregnancy.

METHODS: The present prospective cohort study, performed between April 1, 2013, and May 31, 2016, enrolled primigravidae aged 25-35 years before 13 weeks of pregnancies who were experiencing back pain and did not have prior symptoms of sacroiliac dysfunction. Participants attended regular follow-up over 6 months and clinical functional tests were used to diagnose sacroiliac dysfunction. Women with sacroiliac dysfunction were assessed at 3-week intervals with a numeric pain rating scale (NPRS) and the pregnancy mobility index (PMI).

RESULTS: Among 1500 women who fulfilled the inclusion criteria, 1181 (78.7%) were diagnosed with sacroiliac dysfunction and 1143 completed all follow-up. Pain assessed by the NPRS gradually worsened from the first toward the third trimester ($P<0.001$). The level of disability assessed by the PMI also increased from the beginning to the end of pregnancy ($P<0.001$).

CONCLUSION: Sacroiliac dysfunction represents an important problem during pregnancy; pain severity and mobility problems increased during the course of pregnancy in the present study.

AUSTRALIAN NEW ZEALAND CLINICAL TRIALS REGISTRY: ACTRN12613000246785.

KEYWORDS: Incidence; Mobility assessment; Pain; Pregnancy; Sacroiliac dysfunction

Hypothesis

- SID significantly influences pain intensity and degree of disability of pregnant woman

Methods

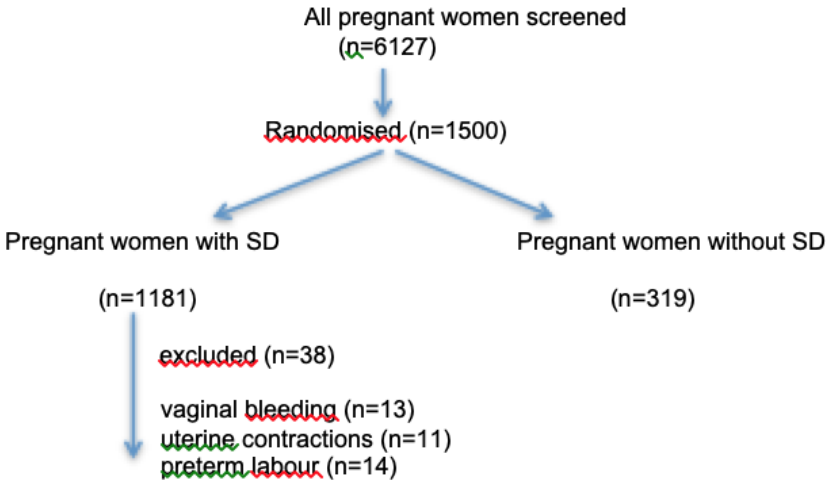
- Prospective study
- primigravidae between 25 - 35 YOA with back pain, gestation age before 13 wks.
- Exclusion– spine surgery, previous SID out of pregnancy, spondylitis, symptoms suggestive of SID
- 3 of 5 tests positive

Assessment

- Numeric pain rating scale (NPRS) for pain intensity
- Pregnancy mobility index (PMI) for degree of disability
- In line with:
  - European guidelines for the diagnosis and treatment of pelvic girdle pain
  - Clinical practice guidelines for management of pelvic girdle pain in pregnancy and postpartum
  - Evidence-based diagnosis and treatment of painful sacroiliac joint

Study protocol and results

- FA in three weeks intervals by NPRS and PMI assessment till 37 wks.



0-13 weeks	Assess for the presence of SD Measured pain (NPRS) and disability (PMI) (n=1181)
16 weeks	Re-assess for the presence of SD Measured pain (NPRS) and disability (PMI) (n=1172) Excluded (vaginal bleeding n= 9)
19 weeks	Re-assess for the presence of SD Measured pain (NPRS) and disability (PMI) (n=1172)
22 weeks	Re-assess for the presence of SD Measured pain (NPRS) and disability (PMI) (n=1172)
25 weeks	Re-assess for the presence of SD Measured pain (NPRS) and disability (PMI) (n=1157) Excluded (vaginal bleeding n= 4, uterine contractions n=11)
28 weeks	Re-assess for the presence of SD Measured pain (NPRS) and disability (PMI) (n=1157)
31 weeks	Re-assess for the presence of SD Measured pain (NPRS) and disability (PMI) (n=1149) Excluded (preterm labour n= 8)
34 weeks	Re-assess for the presence of SD Measured pain (NPRS) and disability (PMI) (n=1143) Excluded (preterm labour n=6)
37 weeks	Re-assess for the presence of SD Measured pain (NPRS) and disability (PMI) (n=1143)

Results – pain intentsity

Table 1. Percentage of participants with different levels of self-reported pain intensity assessed by Numeric Pain Rating Scale in first, second and third trimester (n=1143)

1st trimester intensity			2nd trimester intensity			3rd trimester intensity		
	n	%		n	%		n	%
1	244	21.3	*4*	364	31.8	*4*	69	6.0
2	528	46.2	*5*	354	31.0	*5*	176	15.4
3	371	32.5	*6*	339	29.7	*6*	266	23.3
			7	36	5.5	*7*	264	23.1
			8	23	2.0	*8*	246	21.5
						9	120	10.5
						10	2	0.2

Results – mobility

Table 2. Mean scores of the Pregnancy Mobility Index (PMI) scale in first, second and third trimester of pregnancy (n=1143)

	First trimester PMI (SD)	Second trimester PMI (SD)	Third trimester PMI (SD)
Daily mobility	54.1 (5.08)	81.3 (8.83)	86.4 (6.63)
Household activity	47.4 (4.53)	79.7 (7.32)	87.6 (6.62)
Mobility outdoors	43.8 (4.47)	81.1 (7.78)	85.7 (6.95)
PMI total	48.1 (2.78)	80.6 (7.29)	86.6 (6.25)

Conclusion

- confirmed increase in SD symptoms during the course of pregnancy
- pain in the first trimester may be a strong predictor of pain in the third
- special attention needs to be made for women with high scores of pain and disability, and more positive diagnostic tests, both being predictive for SD persistence

Study 2

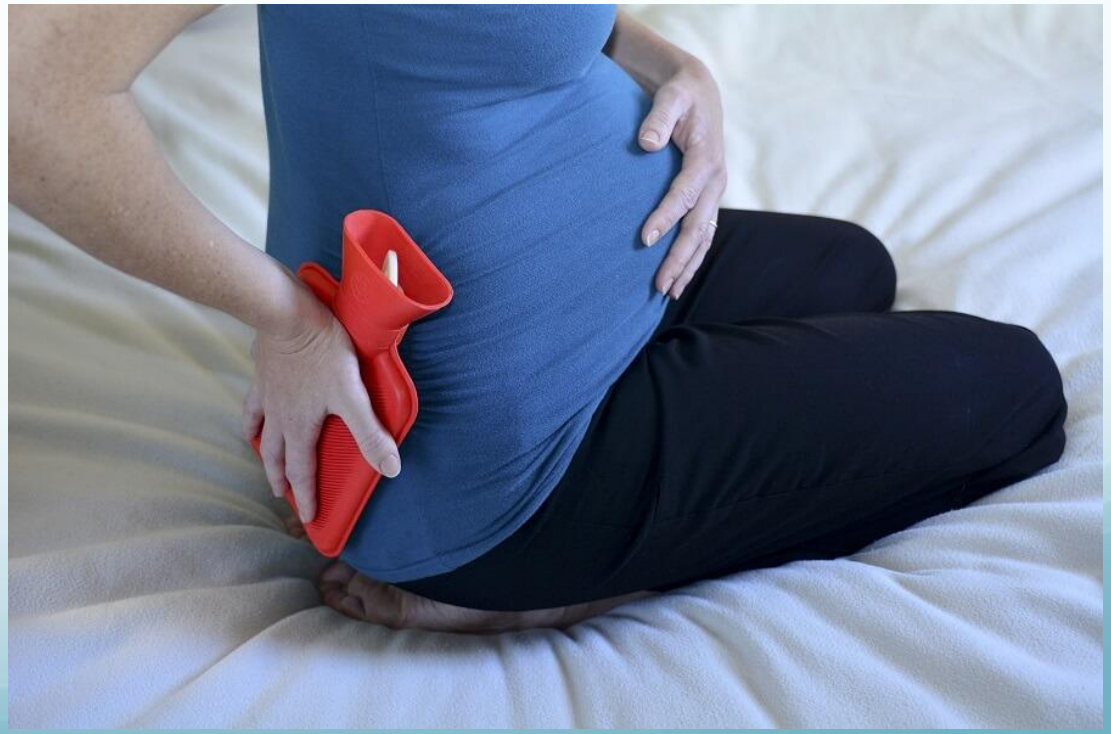
- The influence of advice on therapeutic exercise on reduction of sacroiliac dysfunction symptoms in pregnancy

- Manuela Filipec,
  PhD Thesis, March 2019

- Mentor Ratko Matijevic

Hypothesis

- Expert advice about therapeutic exercise reduces the symptoms od SPD during pregnancy

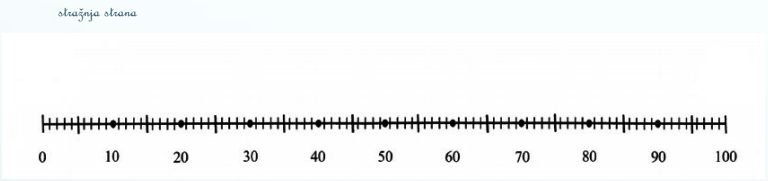


Methods

- RCT
- Pregnant women 10 - 34 wks., 24 – 45 YOA
- symptoms suggestive of SID, 3 of 5 diagnostic tests positive
- Exclusion
  - spine surgery, previous SID out of pregnancy, spondylitis

Assessment

VAS (pain)



QUEBEC (mobility)

PARAMETRI PROCJENE	0 Bez ikakvih poteškoća	1 Uz minimalne poteškoće	2 Uz poneke poteškoće	3 Uz umjerene poteškoće	4 Uz jake poteškoće	5 Nemogućnost izvedbe
Izlazak iz kreveta						
Spavanje noću						
Okretanje u krevetu						
Vožnja autom						
Stajanje 20 – 30 min.						
Sjedenje nekoliko sati						
Penjanje stepenicama						
Šetnja 300 – 400 m						
Šetnja nekoliko km						
Dosezanje predmeta na polici						
Bacanje lopte						
Trčanje 100 m						
Uzimanje hrane iz hladnjaka						
Pospremanje kreveta						
Oblačenje čarapa						
Sagibanje preko kade						
Pomicanje stolca						
Guranje i otvaranje vrata						
Nošenje dviju vrećica						
Podizanje i nošenje predmeta						

RM, 2019

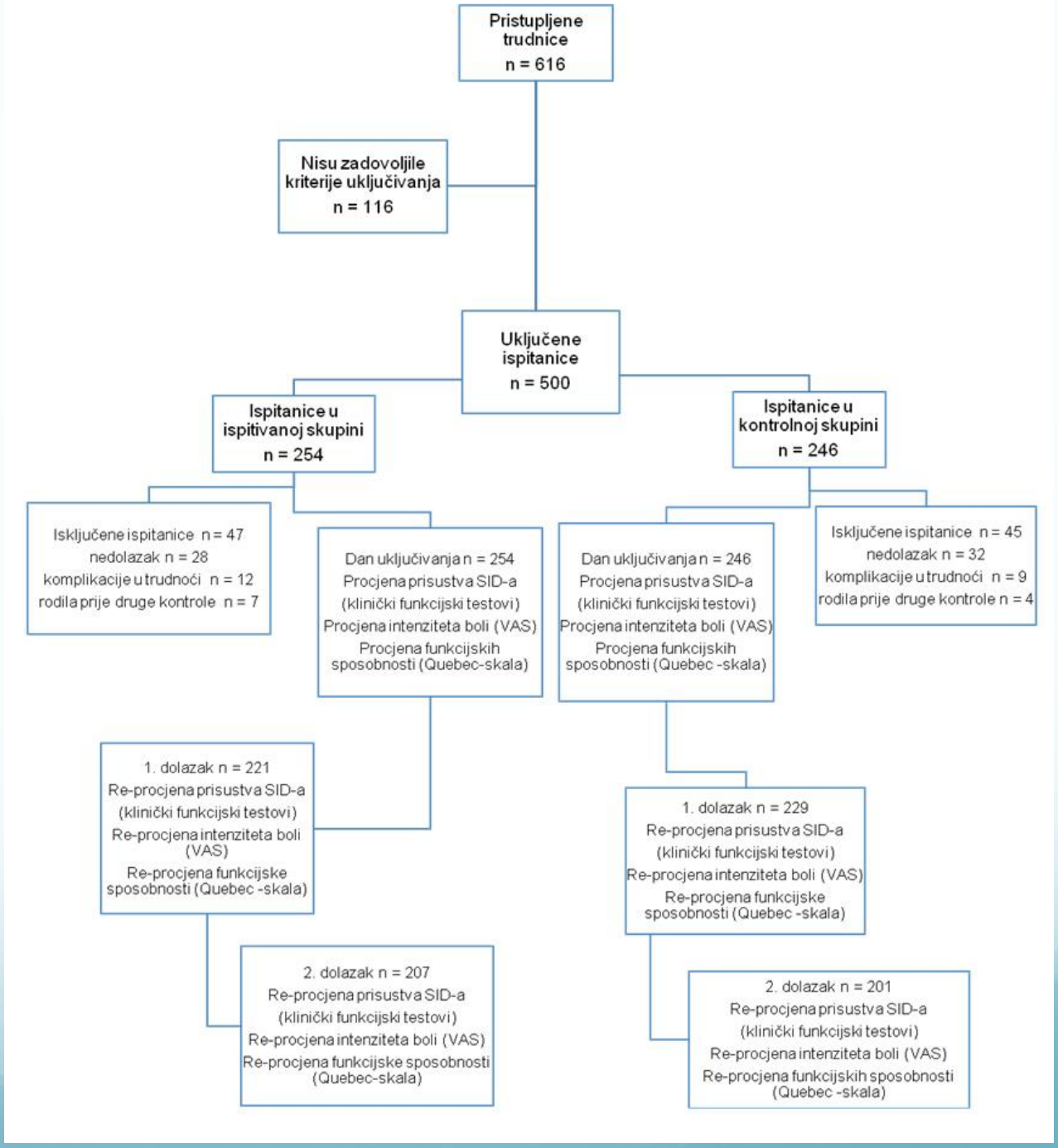
Study Group

- Expert advice on therapeutic exercise

Control Group

- Normal life habits

Flow chart



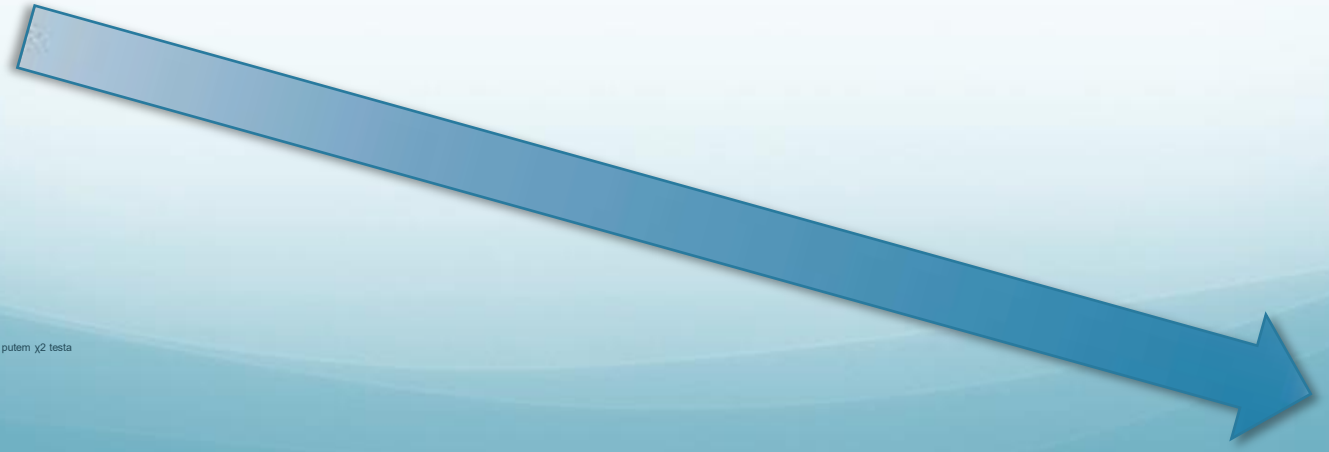
RM, 2019

Incidence of SID

	Total (N = 616)			
81%	Primip N = 327	Multip N = 289	Singlton N = 512	Multiples N = 104
	N (%)			
SID	277 (84,70)	223 (77,16)	410 (80,07)	90 (86,53)
	N (%)			
Study (N = 207)	123 (59,40)	84 (40,60)	176 (85,00)	31 (15,00)
Control (N = 201)	105 (52,20)	96 (47,80)	181 (90,00)	20 (10,00)

Pain intensity

	Pain intensity at enrolelemnt		Pain intensity 3 wks later		Pain intentsity 6 wks later	
	Study (N = 207)	Control (N = 201)	Study (N = 207)	Control (N = 201)	Study (N = 207)	Control (N = 201)
VAS	$\bar{x} \pm SD$					
	86,00 ± 6,35	84,57 ± 5,89	39,38 ± 18,94	86,62 ± 5,00	6,7 ± 5,87	88,21± 4,05
p	0,928		0,001		0,001	



* Dobiveni rezultati analizirani su putem $\chi 2$ testa

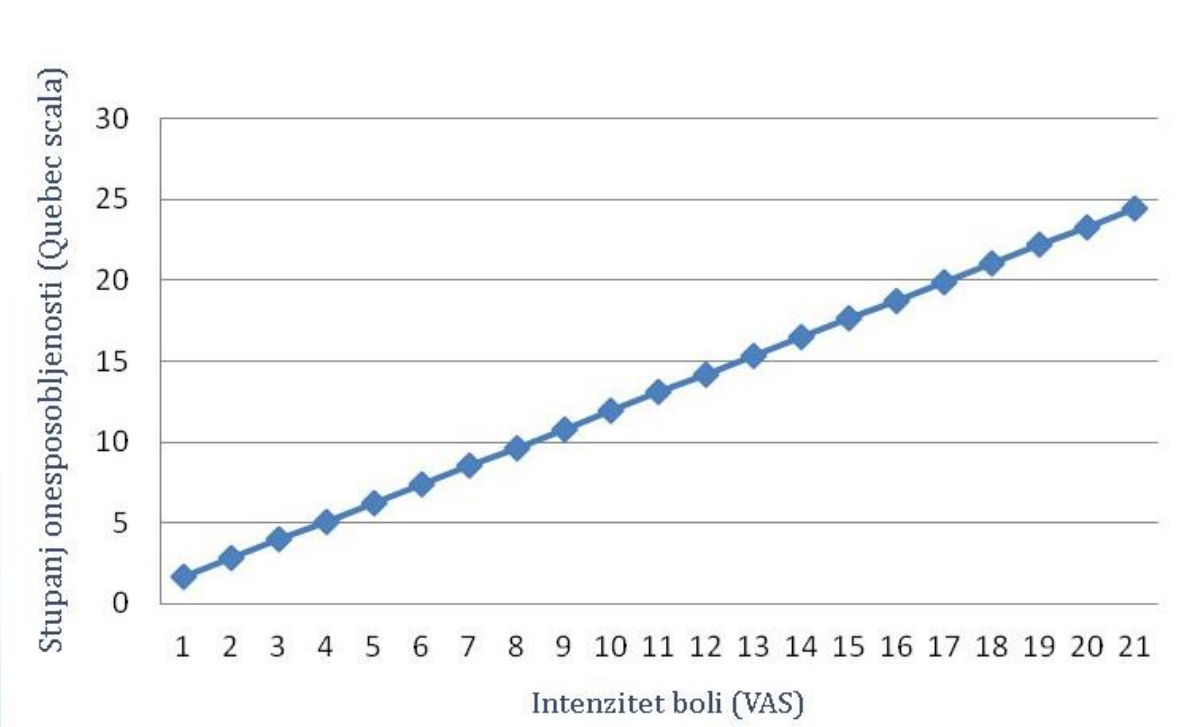
Degree of disability

	Degree of disability at enrolement		Degree of disability after 3 wks		Degree of disability ofther 6 wks	
Quebec-scale	Study (N = 207)	Control (N = 201)	Study (N = 207)	Control (N = 201)	Study (N = 207)	Control (N = 201)
	$\bar{x}$ ± SD					
	4,35 ± 0,57	4,53 ± 0,56	1,58 ± 1,20	4,57 ± 0,55	0,45 ± 0,50	4,61 ± 0,52
p	0,495		0,001		0,001	

Time interval regarding reduction of pain intensity and degree of disability

Study group (N = 207)	Enrolemnt/3 weeks		3 weeks/6 weeks		Enrolement/6 weeks	
	$\bar{x}$ ± SD	p	$\bar{x}$ ± SD	p	$\bar{x}$ ± SD	p
VAS	86,00 ± 6,35	0,001	39,38 ± 18,94	0,001	6,77 ± 5,87	0,001
Quebec-scale	87,05 ± 11,42	0,001	31,69 ± 23,98	0,001	8,79 ± 9,95	0,001
Control (N = 201)	Enrolelemnt/3 weeks		3 weeks/6 weeks		Enroelement/6 weeks	
	$\bar{x}$ ± SD	p	$\bar{x}$ ± SD	p	$\bar{x}$ ± SD	p
VAS	84,57 ± 5,89	0,005	86,62 ± 5,00	0,005	88,21 ± 4,05	0,005
Quebec-scale	90,65 ± 11,13	0,004	91,44 ± 11,06	0,117	92,24 ± 10,36	0,001

Regression analysis of the pain intensity and degree of disability in pregnant women with SID



Conclusion

- Higher incidence of SJD in primps *vs.* multips
- Higher incidence in multiple *vs.* singleton pregnancies
- Significant reduction in pain intensity and degree of disability related to expert advice about therapeutic exercise

Final conclusions

- SID is common problem in pregnancy
- SID is serious problem in pregnancy
- One of the most important reasons for sick- leave in pregnancy
- Significantly influence mobility and quality of life of pregnant woman
- Influence parturition

Final conclusions

- Physiotherapy and exercise - the first-line treatment of SID in pregnancy
- Focus on core stability of the trunk and pelvic girdle
- Sacro-iliac belt is prescribed to complement the core stability exercises and to give quick pain relief
- It is vital to engage a physiotherapist who is skilled in treating pregnancy-related pain
- Alternative treatments - anesthetic and steroidal injections into the SIJ (help in pain relief, which lasts from one day or much more long-term). Oral anti-inflammatory medications are often effective in pain relief as well. However, these two treatments may be contra-indicated during pregnancy.