



## Idiopathic Pelvic Girdle Pain as it Relates to the Sacroiliac Joint Use of Manual Therapy for Posterior Pelvic Girdle Pain

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### Abstract

Use of manual therapies in the treatment of posterior pelvic pain is a common practice. The rationale for use of manual therapies is often associated with the structural movement of the sacroiliac joint. Increasing evidence has shown this not to be the case, as manual therapy's effect is more neurophysiological in nature. This article seeks to clarify the difference between the two explanations as well as to expand upon outside influences such as expectations, therapeutic alliance, and equipoise that may influence the outcome of treatment. Treatment effects may be maximized with manual therapy if clinicians have an understanding of the role of each of these variables in their treatment approach.

### Introduction

Posterior pelvic girdle pain is defined by pain experienced between the posterior iliac crest and the gluteal fold, particularly in the vicinity of the sacroiliac (SI) joints.<sup>1</sup> Although the SI joint is only a single potential pain generator among many in this area, the manual therapy literature to date has focused on it as the primary structure that is amenable to manual therapy. However, these studies typically enroll patients based on history and physical examination, findings that have been shown to not be specific to the SI joint.<sup>2-6</sup> Therefore, although the existing literature and this review will focus on the SI joint, the principles and conclusions could likely be broadly applied to the posterior pelvic girdle.

Among patients presenting with low back pain, 10% to 25% of symptoms are thought to originate from the SI joint.<sup>7</sup> Although the exact prevalence of SI pain in patients undergoing manual therapy is unknown, the prevalence in patients with suspected SI pain who undergo diagnostic blocks is reported to be 10% to 40%.<sup>5,8</sup> In addition, approximately 25% of women experience posterior pelvic pain in both the ante- and postpartum periods.<sup>9</sup> The first line of treatment for these patients often involves referral to a physical therapist or chiropractor, whose treatment plans often include manual therapy in the form of a thrust or nonthrust manipulation, massage, or other “hands on” technique aimed at

modulating pain, increasing range of motion (ROM), reducing inflammation, and/or improving tissue extensibility. A recent systematic review of intervention trials for posterior pelvic pain indicated favorable effects on pain after manual therapies.<sup>10</sup> However, other reviews have been less favorable with respect to manual interventions, resulting in conflicting support for these interventions for posterior pelvic pain.<sup>11</sup> Consequently, if manual therapy is to be used in the treatment of SI joint pain, providers should understand what manual therapy may accomplish, as well as its limitations. It is important to appreciate how manual therapy may fit within a comprehensive management strategy for posterior pelvic pain to maximize outcomes. The purpose of this article is to present the mechanisms of manual therapy for posterior pelvic pain, the role of manual therapies in the management of these patients, and how practitioners can generate maximum benefit from these therapies.

### What is Manual Therapy?

Manual therapy has ancient origins rooted in a structural/biomechanical model of pain, which provides the typical mechanistic justification for its use.<sup>12</sup> Pain was thought to be caused by a joint with abnormal motion (either hyper- or hypomobility), or connective tissue that lacks mobility, and therefore restoring normal motion should modify pain. This assumption has created

numerous schools of thought on the implementation of manual therapy, with a large degree of variance in the explanation of what structure is the pain generator, and what technique should be utilized to address it. Consistent across them is the application of forces to the patient's body or body segment, usually with the hands.

### Sacroiliac Joint Movement

Pain arising from the SI joint has been attributed to motion of the pelvic joints, creating an "upslip," "downslip," or some variant of nutation of an innominate bone on the sacrum.<sup>13</sup> Many practitioners of manual medicine perform a series of complex examination procedures predicated on identifying aberrant or dysfunctional variance in this movement. However, newer literature has revealed that, with the exception of the ante- and postpartum periods, the SI joint is inherently stable, with less than 8 mm of movement in any three dimensional axis.<sup>14</sup>

Nagamoto et al observed less than 1° of movement in the SI joint in all planes, far below the scale that could be reliably or accurately detected through palpation.<sup>15</sup> These results are in line with the seminal findings of Tullberg et al, in which SI joint movement was assessed with roentgen stereophotogrammetric analysis in patients who underwent manipulation of the SI joint.<sup>16</sup> The authors found that the manipulation did not alter the position of the sacrum relative to the ilium. Combined, these studies show exceedingly small movements, far below palpable detectable levels. This confounds a clinician-generated narrative of an innominate bone having an aberrant rotation on another, requiring manual correction. The notable exception is the postpartum period, in which 32% to 68% greater movement of the joints within the pelvic ring was observed in women with pregnancy-related pain compared to healthy controls in one case series.<sup>17</sup> However, this has not been demonstrated across larger cohorts of women.

### Physical Examination

Special tests to determine movement of the SI joint have also shown minimal movement in the joint. Both single leg stance and straight leg raise have elicited less than 1° of movement of the joint using radiostereometric analysis.<sup>18,19</sup> Consequently, determining changes in posterior pelvic position through nonspecific exam maneuvers in a joint that has minimal movement has questionable validity.

Many of the limitations of identifying asymmetry in the SI joints are due to natural variance in the bony structures that serve as landmarks, and the fallibility of palpation. Preece et al, in a cadaveric study, found the mean difference in the angle between the anterior superior iliac spine and the posterior superior iliac spine side to side to be 13° ± 5°.<sup>20</sup> Although no correlation with pain could be established in this study, it does demonstrate the

natural variability that would confound manual assessment. The validity of palpation is further questioned by studies indicating very low reliability for these tests. Robinson et al found kappa values for palpation tests to be 0.06 (ie, very low) and Cooperstein found interexaminer reliability for palpation of the posterior superior iliac spine to yield a kappa of 0.27.<sup>21,22</sup> Stovall and Kumar found all interexaminer reliability for asymmetry assessment to yield a kappa value below that of any clinical utility.<sup>23</sup>

### Treatment Response

With the movement of the SI joint below the threshold for a clinician to detect, special tests lacking validity in movement, and a high degree of natural variance in palpable landmarks, identifying SI joint dysfunction is unlikely. This calls into question the common explanations given by manual therapy schools regarding a biomechanical issue that needs manual correction. However, what is undeniable is that there is a large cohort of patients presenting for care with a chief complaint of SI joint pain.<sup>24</sup> Given the deficiencies of the physical examination, the arbitrary differentiation of SI joint pain from posterior pelvic girdle pain is likely inappropriate in this group. So although it may be difficult to assess movement of the SI joint specifically, patients with posterior pelvic girdle pain may still benefit from manual therapy to address their pain and facilitate an increase in capacity for active movement-based therapies.

Although it is beyond the scope of this paper to review the philosophical differences between schools of manual therapy, there is no evidential consensus of one school being superior to the other. In fact, results of sophisticated meta-analysis show that, in the management of low back pain, 81% of the variance in acute pain outcomes related to manual therapy is explained by nonspecific factors, whereas only 3% of the variance results from the specificity of who provided the interventions, or which interventions were provided.<sup>25</sup> This suggests that the observed effects of manual therapy are derived from nonspecific elements integral to the provision of techniques, as opposed to specific biomechanical elements of treatment. These nonspecific effects are often deemed either placebo effects or contextual factors.<sup>26</sup> If clinicians are to use manual therapy in the treatment of posterior pelvic pain, they must gain an understanding of the nonspecific effects associated, and the ways with which to maximize those effects toward positive outcomes.

The study of mechanisms for manual therapy's effectiveness, in general, has continued to show pain relief to be better explained by neurophysiological effects than structural change. That is, although manual therapy has shown effectiveness for short-term relief of posterior pelvic pain, these effects are more likely contextual and nonspecific.<sup>27</sup> Rather, clinical application of manual therapy can be improved if all the mechanisms of effectiveness are better understood to maximize effects, and to

avoid incorrect and possibly harmful narratives from providers that may unintentionally increase fear avoidance and decrease activity. A meta-analysis from 2012 by Darlow et al demonstrated that clinicians with high fear avoidance beliefs were more likely to impart those beliefs to their patients.<sup>28</sup>

### Potential Mechanisms

The mechanisms through which pain-relieving effects occur after a manual intervention include natural history of the condition, and psychosocial factors such as bias, expectation, and anxiety, among others. Bialosky et al have advocated for the use of patient expectations in the implementation of manual therapy treatment for pain with the goals of (1) promoting a physiological response, (2) increasing motivation to participate in a designated program, (3) conditioning an individual to focus on specific aspects of a disorder while minimizing others, (4) changing a patient's understanding of a disorder, and (5) mediating anxiety to decrease or alleviate pain.<sup>29</sup> This is a change in concept within the field of manual therapy from treating dysfunctional tissues toward changing patients' behaviors, beliefs, and their experience of pain. Evidence continues to mount that psychosocial factors related to the prognosis of an episode of pain is as influential as an attempt to assign a pathoanatomical pain generator in low back pain and this can likely also be said for posterior pelvic pain.<sup>30,31</sup>

The effects of manual therapy are related to the context within which the intervention is applied. Stimuli such as the words and tone used by the provider during the patient encounter, the clinical environment, and the perceived expertise of the provider, influence the expectations of the patient for the coming treatment session. Carlino et al offer an excellent review of methods with which to maximize the contextual effectiveness in the implementation of interventions.<sup>32</sup> Positive therapeutic context has been shown to reduce anxiety and activate reward mechanisms.<sup>33</sup> Conversely, negative context can increase patients' pain perception and have lasting effects on the emotional disposition of patients.<sup>34</sup>

The complex physiological responses elicited from manual therapy involve changes in pain modulation circuitry, endocrine, and neuromuscular responses, and changes that can be observed in the peripheral nervous system.<sup>35,36</sup> Often, the biomechanical rationale given by clinicians for utilization of manual therapy is to "bridge the gap" and facilitate patient buy-in to more efficacious modalities, including education and exercise. However, this should not be done at the expense of generating inappropriate narratives for patients. An explanation that joints are "out of place" or "misaligned" can impart a sense of fragility, increase fear avoidance, and uncertainty of prognosis in patients.<sup>37</sup> Clinicians must be mindful of achieving buy-in for program participation without promoting a narrative that patients are "broken" via a

mechanistic explanation of pain.<sup>38</sup> This type of explanation can lead to negative outcomes over the long term.<sup>39,40</sup>

### Utilization

If manual therapy is to be used, clinician-patient communication should emphasize a positive prognosis rather than a mechanical diagnosis.<sup>40</sup> Psychosocial factors have been shown to play a significant role in the prognosis of low back, knee, and shoulder pain. Carragee et al found that psychosocial factors play a larger role than structural abnormalities identified on imaging for low back pain,<sup>41</sup> and it is plausible that the same is true for posterior pelvic pain.<sup>42</sup> The narrative of manual therapy should be oriented toward setting expectations for symptom resolution to maximize its effect.<sup>43</sup>

Thus, before the intervention is performed, providers must deliberately create a positive therapeutic context associated with positive patient expectations. It is essential that an empathic provider actively listen to the patient, as well as perform a thorough examination and provide reassurance that no permanent pathology is present. The patient should be included in developing the plan of care, and they should be educated as to the expected outcome. This promotes a positive context, setting the stage for a positive response to manual therapy intervention.

When manual therapy is used in the treatment of posterior pelvic pain, it should be part of a multimodal plan with the inclusion of exercise and patient education. Choosing a specific technique to perform is likely to be based on the bias and training of the practitioner, as no clear superiority for pain relief is evident when comparing various manual therapy strategies.<sup>44</sup> Case studies and small trials show benefit from high-velocity, low-amplitude joint thrust techniques, muscle energy techniques, and soft-tissue-based interventions. The specific type of stimulus likely does not matter as much as the patient's expectations, equipoise of the practitioner performing the technique, contextual factors, and therapeutic alliance.<sup>27,45-50</sup> Practitioners must be aware of the multifactorial nature of manual therapy effects in order to maximize outcomes of treatment. In the same vein, they must be aware of the possible negative consequences (ie, nocebo) that can result from inaccurate, mechanically focused explanations of their pain.

When considering a biomechanical approach to diagnosing posterior pelvic pain, one must consider that there is a wide variance to what constitutes either "normal" or "ideal" movement.<sup>51</sup> The practitioner's role, when using manual therapy, should be to help patients find their optimal pattern through symptom modification, and then performance optimization. This can be accomplished by graded exposure to previously sensitive movement patterns, or development of new patterns with which to accomplish a task.

Jacobs and Silvernail advocate for practitioners functioning as interactors instead of operators with manual therapy.<sup>52</sup> Instead of perceiving the patient as a passive actor in treatment to which a practitioner provides manual therapy, it is necessary to incorporate the patient into an active role in their care. Although the SI joint likely does not move to a level appreciable with palpation skills, the therapeutic touch afforded by manual therapy can assist in the facilitation of positive neurophysiological effects. This can be used to facilitate patient engagement in active interventions.

## Conclusion

There is a paucity of evidence related to the implementation of manual therapy for posterior pelvic pain. Instead, studies have focused specifically on the SI joint, where studies have shown that the effects of manual therapy are not mediated by structural changes to the joint. Support for manual therapy instead arises mostly from case studies and expert opinion, which typically fail to differentiate SI joint pain from the broader posterior pelvic pain. Future research is clearly needed to develop clear inclusion and exclusion criteria for those patients who will most likely benefit. In addition, since there is evidence that a patient's perception of a painful situation and beliefs can be imparted to them by clinicians, the narrative of correcting anatomical abnormalities may not be accurate. Given that the goal of treatment is to facilitate patient independence and recovery from pain, the focus of treatment should be on a positive prognosis, not on the correction of undetectable abnormalities that may not be associated with pathology. Clinicians should account for the psychosocial risk factors that may influence a patient's prognosis in the broader context of the patient's experience. Failing to do so may lessen any beneficial effect that manual therapy may impart.

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## Disclosure

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