

Zjawisko dominującego i utajonego zablokowania stawu krzyżowo-biodrowego w bocznym skrzywieniu kręgosłupa – problemy związane z terapią miednicy

Phenomenon of the dominant and latent blocks of the sacroiliac joint in lateral curvature of the spine - problems related to the pelvis therapy

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Streszczenie:

Od najmłodszych lat życia dziecka w wielu wypadkach postrzegamy wielopłaszczyznowe odchylenie kręgosłupa od osi długiej ciała. Odchylenia te mają ścisłe powiązanie z ustawieniem kości miednicy względem siebie, w czym istotną rolę odgrywają stawy krzyżowo-biodrowe a ściślej mówiąc ich dysfunkcja.

Nawet niewielkie przesunięcie kości krzyżowej względem kości biodrowej powoduje zmianę przestrzennego ustawienia całego kompleksu miednicy, segmentów kręgosłupa umiejscowionych powyżej oraz stawów biodrowych. Wczesna interwencja w diagnostyce dysfunkcji tych stawów u małych dzieci daje nam możliwość skutecznej korekcji miednicy względem kręgosłupa jeszcze na etapie tzw. "skoliozy kompensującej", gdy problem tkwi jeszcze tylko w asymetrycznym ułożeniu miednicy determinującej ustawienie kręgów w przestrzeni i jest jeszcze całkowicie odwracalny.

Zespół badawczy potwierdził fakt występowania „zjawiska dominującego i utajonego zablokowania stawu krzyżowo-biodrowego” stwierdzając jego obecność u 50% badanej grupy.

Powyższe zjawisko może być przyczyną braku pełnej skuteczności korekcji kompleksu miednica-kręgosłup. Zatem w przypadku przeprowadzenia terapii tylko jednego stawu krzyżowo-biodrowego u dzieci ze skoliozą należy spodziewać się, że w co drugim przypadku nie przyniesie zamierzonych rezultatów.

Należy przynajmniej dwukrotnie wykonywać badania manualne celem oceny stanu obydwu SKB i porównania ich wyników z badaniem pierwotnym. Realizujemy wówczas zasadę terapii manualnej, badania przed i po leczeniu manualnym.

Słowa kluczowe:

staw krzyżowo-biodrowy, terapia manualna, skolioza, zablokowanie

Abstract

The deviation of the spine from the long vertical line of the body can be detected from the early years of a child. The deviation is closely related to the position of the pelvic bones to each other and sacroiliac joints, especially their disfunction, play an important part in this process.

Even a slight shift of the sacrum relative to a hip bone causes the change in the spatial arrangement of the pelvis complex, spine segments located above as well as the hip bones. Early intervention by early diagnosis of the disfunction in little children gives us a chance to correct efficiently the pelvis relative to the spine at the level of so-called "compensatory scoliosis" when the problem lies only in the asymmetric arrangement of the pelvis that affect the spatial arrangement of the vertebrae and is totally reversible.

The research team confirmed the fact of occurring "the dominant phenomenon and latent blocks of sacroiliac joints". Its existence has been proven in 50% of subjects.

The examination and therapy of joints is relatively difficult taking into consideration the phenomenon described in this work. In case of a therapy of only one joint, no intended results can be expected in every second case.

There should be at least two manual examinations to assess the condition of both sacroiliac joints and comparing them with the primal examination. The rule of the manual therapy and examination before and after the therapy is applied in such a case.

Key words:

sacroiliac joint, manual therapy, scoliosis, block

Introduction

Posture disorders in children, and in particular the lateral curvature of the spine, occur very often these days. Already in the early years of a child's life, we can observe and recognize the deviation of the spine from the long axis of the body. These deviations are closely linked to the location of the pelvic bones in relation to each other. And for this condition the sacroiliac joints, and more specifically their dysfunctions, are of most importance. The joints are not very mobile, just about 5 degrees about their axis, but they do play the most important role – one might even say they determine – the correct or incorrect spatial position of the body, and they are closely related, within the biomechanical dependence, to mobility of the hip joints – such having impact on the proper gait pattern. The early diagnosis and therapy of the sacroiliac joints, at the initial stage of the curvature formation, allows to minimize the effects of the scoliosis at a later stage of a child's development.

The aim of this study is to document the authors' conclusion, that the pelvis, and in particular the dysfunction of the connection between the sacrum and the hip joints (which constitute the sacroiliac joints – the foundation for a spinal column) is, in fact, the basis of a body posture statics disorders. Even a small shift of the sacroiliac joint, in relation to the hip bone, causes a change in the spatial orientation of the entire pelvis complex, which ultimately results in the deviation of the whole spinal column from the long axis of a body. According to this theory, the early intervention, at the time of the diagnosis process of those joints dysfunction in young children, allows to effectively correct the pelvis's position in relation to the spine – at the stage of so called "Compensatory scoliosis" (A. Sadowski), where and when the problem still lies only in the asymmetrical alignment of the pelvis, which determines the spatial orientation of the vertebrae, and is still fully reversible.

The above statement seems obvious, but in the course of therapy of the sacroiliac joints and the accompanying scoliosis, the authors have encountered certain difficulties in such the process of the treatment application. The difficulties have inspired this research and the careful evaluation of the performance of both sacroiliac joints in the treated cases. Initially, the difficult to interpret performance of the sacroiliac joints seemed to be pure coincidence, an anomaly or even an error within the procedure. However our professional curiosity, and the desire to explore the mechanisms of the sacroiliac joints dysfunctions – which, at the early stages, we found difficult to comprehend – became an actual inspiration and the keynote of this research.

In our daily work with the youngest patients, we have diagnosed and treated, among others, the sacroiliac joints therapy cases, considering it the basis for our further work with the scoliosis – in order to make the best possible correction of the pelvic spatial orientation. We have used the method of treatment repositioning the incorrect alignment of the sacrum in

relation to the hip bones. In a number of cases, the unlocking of the sacroiliac joint in the right direction brought about the desired effect of the complete – or at least partial – recovery of the symmetry of the body. However, in some cases, it appeared that after unlocking of the sacroiliac joint, the disturbed posture statics of the child's body did not improve, and even deteriorated somewhat. This had raised certain questions regarding the nature and mechanisms of the phenomenon.

Within the methodology we applied, each case had been examined in the same way before, during and after the treatment of the sacroiliac joints. In case of the palpation diagnosed blockage of only one SIJ, and proper mobility of the opposite joint, we have proceeded with treatment of the blocked area using the manipulative techniques together with the directional repositioning. Further, we have examined both of the sacroiliac joints. The results of the mobility evaluation of both the joints have shown, difficult to interpret, phenomenon of the appearance of the blockage in the joint opposite to the one blocked previously. In short, the follow up examination, after the successful treatment on the sacroiliac joint originally blocked, has revealed the blockage of the opposite sacroiliac joint. Paradoxically, unlocking of one SIJ seemed to be revealing, one might say, the other co-existing, not diagnosed during the mobility tests, invisible at first, blockage of the other SIJ. Performing the repositioning manipulative treatment on this other joint, led us to establishing of the stabilized, proper functional status. The third examination, confirming the above described process, we have considered the final one.

The detected phenomenon we have unanimously called “the dominant and the opposite latent blockage of the sacroiliac joint”, where initially only the dysfunction on one side can be noticed. And only the elimination of the dominant SIJ dysfunction (which, in a way, obscures the co-existing problem) allows to reveal, during examination, the “latent” SIJ dysfunction (term introduced by the authors), and the actual completion of the whole process of the pelvic joints therapy.

It shall be noted, that the above-described phenomenon occurs only in some of the children. To word it more clearly, the SIJ examination in children with scoliosis reveals three tendency types of the co-existence of the sacroiliac joints dysfunctions. In the first variant, the simultaneous blockage of the two SIJs is diagnosed, so during the therapy we are treating both joints. The second variant would be the case, when the initial examination shows only blockage of one SIJ. And the, so called, verification check – following the therapy – confirms that there is no more dysfunction in neither of the SIJs. And the third variant can be defined as the dominant and the latent blockage of the sacroiliac joint, where the initial examination shows only blockage of one SIJ and, after the primary repositioning therapy has been applied, the blockage of the opposite SIJ occurs. After the following repositioning maneuver therapy on the latter joint, the third and final examination shows the absence of dysfunctions in both of the

SIJs. Therefore we may talk about the so called *dominant sacroiliac joint blockage* and *the latent joint blockage* phenomena.

Materials and methods

The total of 80 children have been tested, 43 boys (53.75%) and 37 girls (46.25%), aged from 4 to 15 years (age 4 years – 5 persons or 6.25%, 5 years – 5 persons or 6.25%, 6 years – 12 persons or 15%, 7 years – 12 persons or 15%, 8 years – 10 persons or 12.5%, 9 years – 9 persons or 11.25%, 10 years – 3 persons or 3.75%, 11 years – 8 persons or 10%, 12 years – 4 persons or 5%, 13 years – 2 persons or 2.5%, 14 years – 3 persons or 3.75%, 15 years – 1 person or 1.25%), all with the diagnosed scoliosis.

During the tests we have evaluated:

- pelvic symmetry - skewness and twist
- SIJ mobility during initial examination
- SIJ mobility during verification examination
- SIJ mobility during final examination

To assess the functional status of the sacroiliac joints, for the purpose of this study we used the following tests:

1) SIGN SPINE TEST - The Vertebra Drift Test (Lewit)



Fig. 1 Sign Spine Test - result negative - joint movable / Source: personal contact with K. Lewit, training materials A. Sadowski.

2) STANDING FLEXION TEST (a symptom of overtaking)

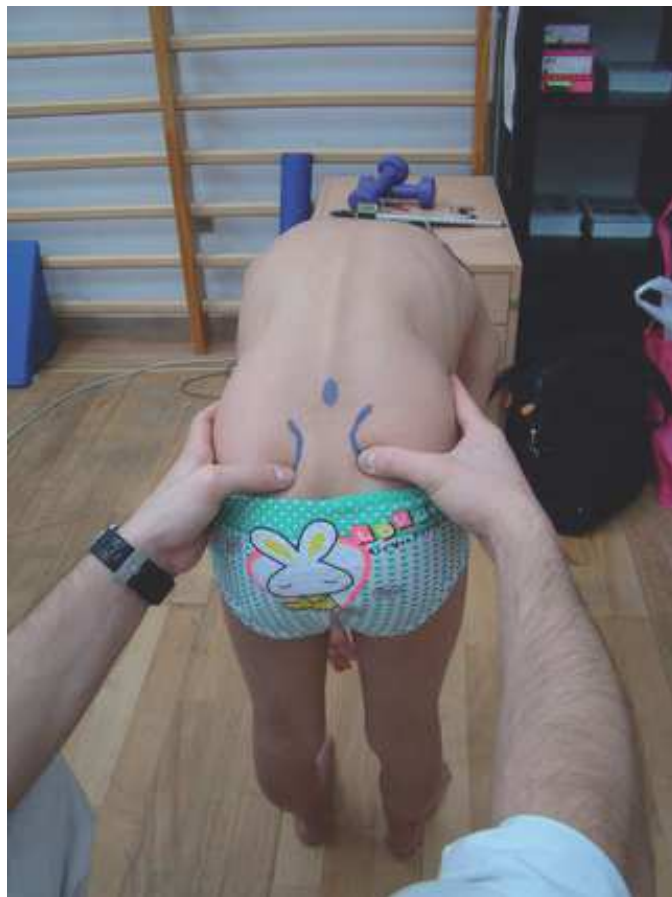


Fig. 2 ymptom overtaking - Assessment of SIJ mobility in a standing position

3) GILETT TEST



Fig. 3 Reverse Movement Test – evaluation of the SIJ mobility in sitting position – joint movable

4) EVALUATION OF THE SYMMETRICAL POSITION OF THE WINGS OF ILIUM



Fig. 4 Determining the wings of ilium height using a level tool

5) PELVIS CIRCULAR TEST

To objectify the pelvis asymmetrical position evaluation, the authors (Olędzki, Sajko, Sadowski) have developed, for the research purposes, a test for measuring the pelvis, called by the research team the PELVIS CIRCULAR TEST. Comparing the symmetry of alternating distance between the rear upper iliac spines and the iliac spines front on the opposite side.



Fig. 5 Measurements in the Pelvis Circular Test /source: Self-concept/

Methodology

After the initial examination with the above described methods, in case a dysfunction of one of the sacroiliac joints had been found as a result of the three tests applied in the order listed – the therapy of this joint was introduced. The therapeutic technique chosen by the authors is a manipulation in the specific direction, depending on the position of the displaced hip bone, also known as the Push or the Repositioning Maneuver. Once the manipulative thrust had been administered, each of the patients was tested a second time, in order to assess the effectiveness of the treatment and to compare the result with the initial examination. Exactly at this stage of the study, the particular variants could have been captured. In the first variant, the status of both the sacroiliac joints had been assessed to be correct. In the second variant however, the dysfunction of the second joint, the one initially assessed as correct and not treated, had been captured and diagnosed. This phenomenon we have described as the, so called, latent blockage of the sacroiliac joint. Upon applying the manipulation treatment, we have been able to achieve the proper functioning of this joint. The result of the pelvic statics examination, with the two last listed tests, allowed to assess the statics as correct.

Results

All the examined children had shown symptoms of the asymmetric pelvis alignment. Vast majority, for as many as 57 children of the total number examined (71.25%) had the skewed hip bones alignment, in 40 children (50%) it had been the left-sided skewness and in 17 children (21.25%), the skewness had been to the right side. In the remaining 23 children (28.75%) there had been found the pelvic sprain (distortion) condition.

The manual SIJ examination, during the initial examination (the first one), had shown in 36 cases (45%) the L SIJ dysfunction, in 24 cases (36%) the R SIJ dysfunction, in 17 cases (21.25%) simultaneous dysfunction SIJ on the L and R sides, and only in 3 cases (3.75%) there had been no dysfunction.

After applying the manipulation technique to the SIJ with the unilateral dysfunction (60 patients), the research team had performed the second examination of the sacroiliac joints in order to assess their functionality. It was then, that the latent SIJ blockage on the opposite side had been identified. We have found that it occurred as many as 40 times (66.7% of patients treated for the unilateral joint dysfunction, which amounted to 50% of the whole study group). The Chi Test = 0.009 does not confirm the hypothesis about the lack of statistic significance in the regular distribution pattern of the incidence rate of this particular dysfunction. The manipulation therapy in the area of the sacroiliac joint with the latent blockage had been able to recover the joint's proper functionality, which was confirmed by the mobility tests of the sacroiliac joints and the pelvic symmetry test, as well as the pelvic circular test. The remaining group of 20 children participating in the study (33.3%), included cases in which, during the initial examination, the unilateral SIJ blockage had been found and, after the manipulation treatment, in the second,

verifying examination (in this case also the final one) no blockages were found and the pelvis symmetry was confirmed by the pelvic circular test. There were 17 patients (21.25%) in whom, during the initial examination, the bilateral blockage of both left and right sacroiliac joints had been diagnosed, and in 3 children (3.75%) no sacroiliac joint dysfunctions had been found.

Discussion

The research team, in the process of this study, has confirmed the existence of the described phenomenon within the studied population of the patients. However, to the questions related to mechanisms of formation and to processes contributing to “the phenomenon of the dominant and the latent blockage of the sacroiliac joint,” the authors, in their discussion, provide different answers and interpretations.

In the subject literature we may notice some research papers drawing attention to the importance of the coexistence of the sacroiliac joints dysfunction with the body posture disorders and, to be more precise, with the spinal curvature degrees [6, 7, 8, 9], the relationship between the sacroiliac joints pathology and the abnormal muscle tension [10, 11] determining the position of the hip bones against the sacrum [17, 18, 19, 20], as well as the impact of the sacroiliac joints dysfunction on the lateral curvature of the spine [5]. Reports dealing with the mutual interaction of the sacroiliac joints and, more to the point, with the impact of the dysfunction in one joint on the opposite joint, are very scarce. We may take into account however, the notion of the chain reaction caused by the dysfunction of the particular joints in the locomotor system [12, 13]. Cibulka and Koldehoff emphasize the mutual biomechanical impact of the joints in the gait function. Saulicz and Gnat highlight the role of the overload factor in terms of an impulse transmitted through the lower limb, as a source of the sacroiliac joint pathology [14, 15, 16, 17, 18, 19, 20]. Still, it is difficult to precisely determine the behavior of the sacroiliac joint opposite to the dysfunctional joint. What are the mechanisms guiding the process of the dysfunction compensation? And is the latent blockage phenomenon, as described in this paper, a part of this process? How to explain the behavior of the joint initially diagnosed as functioning correctly?

D. Olędzki and T. Sajko believe, that the blocked SIJ, which had not been found during the initial examination, had not been visible due to the dominance or the lead of the blockage evident on the opposite side, and only after the latter, dominant blockage had been unblocked, in a way it uncovered the co-existent, and possibly present from the very beginning, the latent blockage. The question arises therefore, how to interpret the objective, measurable Vertebra Drift Test. May this be the case, that its larger value on the side with no dysfunction, being considered the standard, is being misinterpreted and is, in fact, the false standard? We have no such things like the proper scale and

the SIJ standard movability table. To further illustrate this issue, we ask you to imagine an old shopkeeper's scale, we put the weight of 1 kg on one scale pan, and the 2 kg weight on the other. Obviously, the scale will overbalance to the heavier side. Still, we must remember, that on the other side there is also a weight, just a smaller one, and once we take away the dominant load, the scale will immediately overbalance to the side with the 1 kg weight.

Another way of explaining the formation of the "latent blockage," suggested by A. Sadowski, is based on the idea that the repositioning treatment applied to the hip bone on the side of the SIJ with the initial dysfunction, is a potential cause of the following sacroiliac joint blockage on the opposite side. Taking into account the phenomenon of the transferred motion, we may say, that we don't know the effects of the sacrum displacement on the side of the joint, initially with no dysfunction. Attempting to explain the phenomenon described here, the author points out, we must not forget the so-called neuroregulation in the process known as chain dysfunctions of the locomotor system [12,13].

Undertaking the research, the authors were aware of the difficulties to objectify the assessment of the sacroiliac joints functional status, a problem mentioned in several studies [14, 22]. Still, we strongly believe that the work on this subject shall not be neglected, based solely on the assumption that the sacroiliac joints, due to their low mobility, are of little importance for the general biomechanics of the

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musculoskeletal system. On the contrary, taking under consideration that they are one of the most important factors for the proprioceptive activity, the important link in the chain disorders, the source of the pelvis and spine statics disorders [12, 13], the frequent source of radiating pain and the spot of inflammatory lesions [10] - these phenomena need to be addressed. And it follows, that the issue of the sacroiliac joints pathology should engage representatives of all of the medical professions – not only physiotherapists but also physicians and specialists in the areas of orthopedics, rehabilitation, rheumatology, preferably with some knowledge about the manual therapy techniques. In fact, some are already involved in the sacroiliac joint research, and there are studies to show it, although they do present seemingly contradictory opinions. From the pessimistic view, that it is not possible at all to objectively assess the functional status of a joint [20], through the assessment method based on the own sense of the joint's motion [12, 13], to some studies suggesting using the quantifiable metric scale [21, 23]. Undoubtedly, following the principles of the evidence-based medicine (EBM), one may assume in advance, that the objective assessment of the SIJ functional status is possible. Thus, it must be possible to be able to evaluate the impact of the sacroiliac joints on the statics of the pelvis as a whole, the spine curvature in both the sagittal and the coronal planes [5, 6, 21, 24], and on the distant parts of the locomotor system.

Conclusions

Together with the lateral curvature of the spine, even with a small curvature angle and a slight degree of rotation at the top of the arc, there occurs a change in the spatial alignment of the hip bones in their relation to each other, which is either the pelvic twist or the pelvic skewness.

In either of the two a manual examination, in a large proportion of cases, confirms the dysfunction of one or both sacroiliac joints, which makes it necessary for the therapist to work and restore the joint's functions and its proper position. Based on their studies, practical experience and the published reports, the authors form an opinion, that the functional evaluation of the sacroiliac joints, which seemingly does not present any diagnostic challenge, may be sometimes quite tricky. This is because there is not enough tests for the joint mobility, which would objectively, in metric or angular scale, define either the normal or a dysfunctional joint. Hence brought about by the authors, more or less measurable joint mobility tests.

The inspiration for the research on the above described phenomenon, have been not always satisfactory results of our work with the patients. In this case children with scoliosis and with the co-existing sacroiliac joints dysfunction. The joints examination and treatment are rather problematic, due to the phenomenon presented in this study, and whenever there has only been one pelvic examination conducted and only one of

the sacroiliac joints has been treated, in children with scoliosis one should expect, that in every other case it will not provide the desired result and perhaps will even worsen the the patient's condition.

The two manual examinations should always be performed, in order to evaluate the condition of both SIJs and to compare their results with those of the initial examination. This way we are applying the manual therapy rule, examinations before and after the manual treatment. If the above recommendations are not implemented, the whole therapy in the child with scoliosis will not be complete, and the correction of the misaligned position of the hip bones and the sacrum in relation to each other, something we strongly emphasize in our work, will only be partial or - even worse - their spatial configuration will be changed, worsening the situation.

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