

## Lumbopelvic Disorders - Local or Global Dysfunction?

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### Lumbopelvic Disorders

Dysfunctions of lumbopelvic region e.g LBP (Low Back Pain), incontinence, sacroiliac joint pain are very common in modern society. Sedentary life style and overweight are one of the main risk factors leading to these disorders [1]. The reason of lumbopelvic dysfunctions is multifactorial, therefore the proper diagnosis and successful treatment is very complex. Recent research has focused on alterations in motor control as potential mechanisms underlying lumbopelvic disorders [2-4]. The authors reported the importance of the deep muscles function as well as the the lumbopelvic motion or breathing pattern [3,5,6].

Anatomical and functional connection between body parts are described by some authors [7-9]. Previous studies have indicated the presence of continuity and connectivity between fascia or muscle that may be anatomically distant from each other [7,8]. The sacrum, pelvis and spine, and the connections to the arms, legs and head are functionally interrelated through muscular, fascial and ligamentous interconnections. It has been also suggested that inappropriate tension in some parts of the body may be transmitted to distant parts of the musculoskeletal system leading to overload and functional restrictions [7]. Moreover any tension at a particular part of the musculoskeletal system may have detrimental effects resulting in global decreased flexibility [7,9]. Non optimal strategies for posture, movement and breathing create failed load transfer which can lead to pain, incontinence and breathing disorders [4].

Some authors have described the synergy between the abdominal and pelvic floor muscles and all the muscle groups surrounding the abdominal cylinder. The pelvic floor muscles are considered to have the dual function of providing trunk stability and contributing to continence. It is maintained by the complex integration of pelvic, spinal, and supra spinal factors [3,10-12]. Current evidence also suggests that the muscles and fascia of the lumbopelvic region play a significant role in musculoskeletal function as well as continence and respiration. Therefore it has been suggested that the lumbopelvic pain, incontinence and breathing disorders have similar reasons [6,10,12]. It is also reported that synergistic function of all trunk muscles is required for effective load transfer through the lumbopelvic region during multiple tasks [13]. The presence of deep muscles asymmetry is also considered as sign of lumbopelvic region dysfunction. The asymmetry in muscles work, strength and length is also considered as strong risk factor of musculoskeletal injury [14,14,15]. Current scientific findings also suggest that decreased hip joint range of motion is known to be the reason of LBP, sacroiliac joint pain or lower limbs injuries [16].

The restrictions in spinal and pelvis motion, inappropriate level of core stability are also linked to gait disorders as well as to lumbo-pelvic pain. The complex coordination involved in locomotion and the need of appropriate mobility and stability was emphasized by Gracovetsky [17]. He has reported that the laterally bending spine causes spinal rotation, which in turn powers the lower limb in walking. The legs recover the energy received from the spine and recycle it back into spinal rotation. This highly coordinated movement needs adequate core stabilization from the deep abdominal muscles and the adequate spinal, upper girdle and lumbopelvic motion [17].

It seems that focusing on singular anatomical structures to comprehend lumbopelvic pain, rather than considering the spine and pelvis as an integrated, interdependent and dynamic biological structure, might lead to the misdiagnosis of lumbopelvic disorders [18]. The proper diagnosis should include the broad assessment of lumbopelvic region as well as all distant parts of the body functionally connected to it. The evaluation of lumbopelvic dysfunctions should be multifactorial including physical and objective tools. Physical examination including observation, palpation is considered as very subjective and sometimes may lead to misdiagnosis. Moreover an examiner level of experience may affect his clinical skills [19]. Therefore it is important to extend the evaluation by objective assessment of muscles bioelectrical activity in specific functional tasks, muscles shape, position and symmetry at rest and during movement visible in ultrasonography and the influence of lumbopelvic dysfunction on motion quality visible e.g. during gait analysis with motion capture system. The complexed diagnosis should be a "gold standard" recommended in lumbopelvic disorders evaluation and treatment.

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