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In a Subject with Cervical, Sacroiliac, Hip Pain and Differential Diagnosis - with Evidence

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Abstract
Cervical and lowback pain are common clinical entity. An evidence based clinical evaluation and laboratory analysis of subjects in diagnosing and using proper medical and physio therapeutic programme were the major objective of this original study of a 40 year old, Subject's: History, life style, clinical findings, lab and radiological reports points at auto immune disorder with low vitamin D levels, and low BMD, where as the subject complaints of recurrent cervicogenic lowback and hip pain with stiffness, due medication by physician followed by physiotherapy were found to be more effective subjectively and clinically. Hence clinical therapist while treating neck and low back pain, should refer or go through the entire clinical entities the subject could have, with due evidence be practiced for quality of the physiotherapy and ensures best health care to the subject.

Keywords: Sacroiliitis, Ankylosing Spondylitis, Bone Mineral Density (BMD), HLB 27 (Human Leukocyte Antigen B 27), Osteopenia, LBA – Low Back Ache, SI – Sacroiliac

Introduction
Due clinical evaluation with evidence in analyzing the underlying etiopathogenesis forms the foundation for a successful clinical outcome. Laboratory and radiological investigations could further facilitate to diagnosis promptly for appropriate means of therapy. This study where an obese subject presenting with unexplained neck pain, hip pain, lowback pain along with fatigue and type II diabetic, aims to evaluate various possible causes with evidence so as to bring an insight of differential diagnosis, a knee component of proper diagnosis.
Prevalence of obesity in U.S adults at 32.1% (Bruce Keller etal 2009), 8.9 % in Bangladesh, 10% in Nepal, 14.8% in India (Balarayan & Viclaneor 2009) Malaysia (12.3%) (Rampal etal 2007)
With obesity musculoskeletal ailments increases as evidenced by a Bangladesh study among obese subjects with 50% had osteoarthritis knee, 35% had LBA, (Salah Uddin etal 2015)
Musculoskeletal conditions cause more functional limitations in the adult population and can cause 4-5% of physical disabilities among them (Reynolds etal 1992) also pain, physical disability affect social functioning, mental health, further diminishing the patients quality of life (Wolf and Pfleger 2003)
The prevalence of SI joint pain has been reported between 13-30% and 13% of individuals with LBA have pain arising from SI joint and 30% of all patients seen in outpatient clinics have pain arising from SI joint (Maugars etal 1996).Making a clinical diagnosis with certainty that pain is originating from the SI joint is challenging (Paris 1997). Possible mechanism in subjects with LBA could be associated with SIJD from muscle imbalance, ligament strain or sacroiliac alignment (James 1976).
Low back pain one of the most common condition seen in clinical practice (AI of N and Welfare 2010), while men and women are equally affected, mostly between the ages of 30 and 50 years and most costly cause of work related disability (Deyo and Weinsten 2001). Patients with groin pain have been shown to be seven times more likely to have a hip disorder only or a hip plus spine disorder than spine only disorder (Brown etal 2004). A fluoroscopic guided intra articular injection among patients with hip pathology have shown buttock region was the most common anatomical location of referred thigh and grain pain (Lesher etal 2008). A careful and thorough history, physical examination, keen understanding of the underlying pathoanatomy and pathophysiology of the common conditions is paramount for accurate diagnosis and appropriate management (Ammendolia

etal 2014). Vitamin D deficiency can cause muscle weakness (Holick 2006) to be differentially diagnosed for cancers, auto immune diseases, cardiovascular diseases, mental function as could be an independent predictor of risk of above said conditions (Holick 2007).

An increasing life style disorders presents with spectrum of disorders in each patient. Hence a profound clinical experience, with exploratory skills, analytical ability are needed by clinical physio therapist to deliver quality based health care, with which obesity could lead to type II diabetes and low vitamin D levels (Diabetes statistical report 2014), This study strives to discuss with evidence where vitamin D deficiency, chronic spine based pain, diffuse muscle weakness, obesity, low BMD, bilateral sacroiliitis, type II diabetes, sedentary life style and mild degree of depression in this single subject necessitates differential diagnosis to be arrived at based on laboratory findings, clinical evaluation to execute physiotherapy following appropriate medical treatment. Thus ensuring practice of healthy reference to concerned medical fraternity for other underlying medical causes to be screened, treated prior to exercises were the core objective of this original study.

Background Information

Mr. XXXX, Aged – 42 years with a past medical history of being an occasional alcoholic, widower was employed as an executive with sedentary life style. He is a known type II diabetic patient and psoriasis since 2014 years and was getting treated with ayurvedic medication complaints of this subject were since 2014 he was complaining of neck pain and stiffness, was treated with intermittently with physiotherapy (IFT and cervical traction) and NSAID and is attending this center for further physiotherapeutic rehabilitation since January 2016 till March 2017

O/E

- Obliterated cervical lordosis
- Bilateral trapezitis
- No radicular symptoms of upper extremities
- Right – shoulder end ranges painful and restricted
- Anteverted scapulae
- Moderate exercise tolerance
- Cervical spine movements painful and restricted

X- Ray Cervical Spine taken in on May 2016 Revealed

Degenerative changes of C4, C5

Laboratory Investigation Reports as on May 2016

- With low vitamin D of this subject of 9.2 ng/ml, B12 at 105, PTH – 974 mg/ml and hba_1c at 6.3% Negative HLAB 27, hyper lipidemia, TG -250 mg, LDL – 176 mg, HDL – 69 mg, TG – 138 mg. CRP less than 3 and ESR at 14. Reports were indicative of the subject to be a type II diabetic with low vitamin D and B12 requires to be treated by physician with due medical measures.

NMRI

While NMRI has shown bony ankylosis of bilateral sacroiliac joint, interlaminar osteophyte at T5-T6 on right side indenting the mecal sac. No significant abnormality in lumbar spine.

CT

- CT scan of the pelvis has shown partial fusion of bilateral SI joint with mild sclerosis along joint. Radiological diagnosis with CT scan was bilateral sacroiliitis

Bone Density

- Bone densitometer taken on July 2016 has revealed osteopemia of left and right neck of femur.

Provisional Diagnosis: Ankylosing spondylitis? C4, C5 disc lesion, obesity? Type II diabetes? Osteomalacia? Sacroiliac Strain? Lowback Ache? Hip Disorder?

Treatment Given Includes

I. Isometric neck exercises and shoulder bracing exercises with PNF techniques.
II. Closed kinematic chain exercises to both upper extremities using Physioball with 6 sets of exercises and 5 repetition each he has shown reasonable progress symptomatically, hence advised to continue home programme with neck care, hot pac and exercises.

Initially he was treated by an orthopaedic surgeon with NSAID and electrotherapy modalities for pain relief, later by a rheumatologist, Since 3 months have prescribed the subject with disease modifying drugs. With physiotherapy, he was getting treated with hot pac and exercises using Physioball, with a frequency of twice weekly of 25-30 minute duration incentive spirometer exercises, regular walking and a set of exercises as home programme.

Discussion

The major purpose of this case study was to analyse the following hypothetical questions with evidence:

a) Subjects with pain and stiffness showing recurrence following physiotherapy be referred to physician?

As he reported to the center with same complaints, after 5 sessions of physiotherapy exercises with we have referred him to an orthopedic surgeon for further diagnosis and treatment, As shown in this subject's lab investigation reports where PTH levels were elevated could be due to hypovitaminosis D, hypocalcaemia (Priemal etal 2010) where his serum calcium was at 8 mg/ ml. also in AS, the levels of PTH are significantly elevated (Baskan etal 2010) and decreased BMD (Serhan etal 2002). Vitamin D is an important in a number of physiologic process, including calcium absorption, innate and adaptive immunity and homeostasis of a number of organs (Qamar etal 2010) Chronic vitamin D deficiency in adults results in osteoporosis, osteomalacia (Bischoff etal 2005) muscle weakness (Janssen etal 2002). Vitamin D also known as calcidol is a fat soluble vitamin obtained from sun exposure, food and supplements (Nicole Ness and Shannan MC Mullen, Bellarmine University, NIN US).

Also related to the history, this subject was likely to have a low vitamin D as an increased prevalence was reported with obesity as fat soluble vitamins is easily stored in adipose tissues, hence with a low vitamin D as an blood stream and being a widower, was in depression, he had limited sun light exposure and poor general health status.

b) Cause of chronic pain, stiffness could be of various clinical reasoning such as fibromyalgia, vitamin D deficiency, calcium deficiency and ankylosing spondylitis?

This subject had vitamin D deficiency manifestations including non-specific back ache, joint pains and generalized body ache (Kanekar etal 2010). As lower bone mineral density and higher bone turn over may be related to inflammation as in AS (Lange etal 2005) and low vitamin D level (Gabriel etal 2014).

This subject having auto immune disorder, vitamin D deficiency might be associated with risk of both susceptibility and severity of the BMD due to significant consequence of innate and acquired immunity (Amarasekara etal 2015).

Low vitamin D and osteopenia could suggestive of osteomalacia (Lange etal 2005). Other rheumatic diseases including AS, RA, Sjogrens syndrome, SLE (Ramagopalan etal 2013). The accurate method of detecting osteopenia and osteoporosis may be provided by the measurement of BMD at the femoral neck (Magrey etal 2010) but severe bone pain and unexpected low BMD in the middle aged could be due to osteomalacia (Saghafi etal 2013).

c) As this subject has shown moderate exercise tolerance being, type II diabetic, exercise be useful? and does obesity could be the base of his ailment?

Obesity: Excess body weight around the waist could lead to type II diabetes (Diabetes Statistical 4 Report 2014). Being obese could lead to osteoarthritis hip and knee (NIDDM). This study subject with a BMI of 44 kg/m^2 being a type II diabetes exercises benefits with weight reduction and to improve glycemic control as evidenced by (Subramanian & Venkatesan 2015).

d) Pain over both hip region with tightness of both adductors to be correlated with due investigations radiologically?

As bone densitometry done in July 2016 has shown osteopenia of spine and both neck of femur, necessitates therapy with vitamin D. While considering Ankylosing (AS) spondylitis but this subject had undetected HLA B27,but has NMRI has revealed bilateral SI joint bony ankylosis and CT scan has shown bilateral sacroiliitis and partial fusion of bilateral SI joint with sclerosis with CRP less than 3 and ESR at 14, AS has to be treated with due medication and physiotherapy.

As this patient clinical has positive Patrick's sign indicative of hip joint pathology, Acetabular labral tears were considered as a result of repetitive trauma (Byrd 1996) resulting in groin pain femora Acetabular morphologies (FAMS) were reported to be the other major causes to be considered (Agricola etal 2014). with adductor injuries most frequent (Andreas etal 2015) groin pain could follow THR (Bin Naser etal 2010) as a complication.

e) Pain and tender sacroiliac joints to be referred to physician or treated with physiotherapy?

CT scan of the pelvis has shown partial fusion of bilateral SI joint with mild sclerosis along joint. Radiological diagnosis with CT scan was bilateral sacroiliitis. 13% of the persistent low back pain have the origin of pain confirmed as the SIJ (Maigne etal 1996). Other probable causes could include acute disc (Arya IACM 2014) herniation but NMRI of this study subject doesn't show any significant abnormality in the lumbar spine.

Pain and tender sacroiliac joints compression and thigh thrust test have shown positive in this subject as sacroiliac joint pain has been implicated as the primary source of back pain till mixter and barr described, disc herniation as a source of pain in the lumbar spine (Mckenzie & Brown 2005). Sacroiliac pain may be the result of direct trauma, unidirectional pelvic shear, repetitive and torsional forces, inflammation (Zeller etal 2005). As the sacroiliac joint is unable to function in insolation anatomically and biomechanically it shares all of its muscles with the hip joint as ligaments such as iliolumbar, sacrotuberous and sacrospinous ligaments of the stability they support affect much of the stability of the sacroiliac joint (Bogduk etal 2005).

Uniqueness

With clinical and literature evidence this original study has analyzed with probable causes, as presented by the history, laboratory and radiological findings. When treatment with physiotherapy provides lesser prognosis, unaddressed medical condition should be thought of and due reference to concerned medical fraternity for the best evidenced physiotherapy practice and promote healthcare as a team.

Critical Clinical Implications

This subject with recurrent cervical pain and stiffness later developed sacroiliac and bilateral hip joint pain with restriction of movements. Lab investigations revealed HLAB 27 negative but high PTH, low vitamin D and decreased BMD and diabetic type II, while anthropometric findings points him as severely obese and radiological findings have recorded him with bilateral sacroiliitis.

Initially he was treated by an orthopaedic surgeon with NSAID and electrotherapy modalities for pain relief later by a rheumatologist, in April 2016 has prescribed the subject with disease modifying drugs, With physiotherapy, he was getting treated with hot pac and exercises using Physioball, with a frequency of twice weekly of 25-30 minute duration and incentive spirometer exercises.

I. Just treating by routine electrotherapy modalities for pain relief, to be reconsidered for cause based therapy than symptomatic relief.
II. Transformation of medical and clinical subjects leart in curriculum for clinical practice with physiotherapy an evidence based.
III. Scientific approach with no reluctance to refer to concerned physician for prompt patient care by the therapist.
IV. Which remains a rare practice an insight of the history, clinical presentation, differential diagnosis prior to starting physiotherapy, and during reevaluation with sessions, therapist should ensure whether any other therapy or advice by other medical fraternity could further enhance quality of patient care be thought of.

Conclusion

Prior to treating a patient with physiotherapy, an analysis of various symptoms, their root cause is recorded, underlying medical causes with supportive laboratory and radiological findings should be considered. Whenever needed subject should be referred for medical management, physiotherapeutic goal during sub a cute stage could be to reduce the symptoms, but long term goals should be aimed at addressing the cause of the problem, where ever possible with due evidence so that concerned subject can be rehabilitated to his maximum potential was the major recommendations of this study. Further studies with larger

sample size and more measurable variables are recommended.

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