

Both Hips – 4/5	Cervical Spine Flexors – 3/5
	Extensors – 2/5
Both Knees – 4/5	Side Flexion – 2/5
	Rotation – 2/5

Atrophy of posterior cervical spinal muscles

- Pain increasing after physical exertion
- Nil radicular symptoms down the arms
- Trapezitis left ++
- Left patella glides painful with mild restriction
- Forward spinal flexion mild restriction with pain in lower lumbar spine

Normal Exagrated Lumbar Lordosis

- Straight Leg Raising (SLR) – NAD
- Bilateral hamstring tightness positive
- While walking occasional balance disturbances with swaying but unilateral balance remains very good
- Headache which was frequent with work related physical exertion

Investigations

Reports of NMRI taken on 21st October 2015: Cervical disc protrusion at C3-C4, C6-C7 level, lumbar disc bulge at L4-L5 level with bilateral forminal compression

Provisional Diagnosis: C3-C4, C6-C7, L4-L5 disc lesion

Treatment Given:

Subject was treated with interferential therapy and non steroidal anti inflammatory drugs frequently elsewhere in frequently. Since the last 6 months this patient was treated by the another with a) shoulder bracing exercises b) Irradiation techniques to both upper extremities normally and with Physioball c) core exercises d) home programme e) hot fomentation application to painful areas of neck f) neck care with a frequency of weekly twice, he has shown moderate improvement, but as noted with exhaustion following mild exercises, cramps, proximal muscles weakness, palpitation with sweating during physiotherapy sessions, he was referred to the orthopedic surgeon for vitamin D evaluation, which has shown a low level of with vitamin D 9ng/ ml, subsequently he was prescribed with vitamin D supplement of tablet D rice for 8 weeks course.

Physiotherapy following 3 weeks after this has shown a greater improvement in the subject's day to day functions.

DISCUSSION

With evidence based clinical practice the following questions needs to be addressed:

Hypothetical Questions: 1

Influence of vitamin D on musculoskeletal disorders

In one RCT, patients with diffuse musculoskeletal pain with vitamin D values lower than 20ng/ ml treated with vitamin D supplement have shown significant improvement (Arvold *et al* 2009). Another study have supported to measure vitamin D as part of clinical and laboratory evaluation in subjects with chronic wide spread pain (Straube *et al* 2009). With vitamin D supplement a steady stable level is reached by about 3 months

(RejnMark *et al* 2012). Life style factors such as clothing, diet, limited solar exposure could influence the vitamin D (Holick *et al* 1999). As this case study subject is working in a closed environment (Factory) and resides in the same campus, with less outdoor activity and lacks exposure.

Hypothetical Question: 2

Impact of vitamin D on outcome of exercises in pain, muscle weakness

Vitamin D deficiency cause muscle weakness vitamin D exerts a direct action on skel *et al* muscle function (P Feifer *et al* 2002). The skel *et al* muscle express muscle cell uptake of inorganic phosphate, which is important for the production of energy rich – phosphate compounds such as ATP and creative phosphate, vital for muscle contraction (Bellido *et al* 1991). This study subject had pain muscle weakness with vitamin D deficiency at 9 ng/ ml.

Vitamin D deficiency is followed by secondary hyper parathyroidism, which exerts a negative influence on muscle function (Stein *et al* 1999). Vitamin D deficiency causes impaired muscle function and muscle weakness, which are however reversible following vitamin D supplementation (Glerup *et al* 2000) (IOM, US 2011) have recorded a link between vitamin D status and physical performance with beneficial effect with vitamin D supplementation of 80 IU/ day, findings of this study concur with the above said reports of improved muscle weakness and function followed by vitamin D supplement and exercises.

Hypothetical Question: 3

Clinical efficacy of vitamin D in multiple disc lesion of the cervical and lumbar spine as evidenced with NMRI

Healthy adults take 600 IU/ d to maintain skeletal health (Institute of Medicine Washington DC US 2010) from RCT; it was evidenced that combined vitamin D and calcium supplementation increased B on D modestly (Francis *et al* 2006). Serum levels of vitamin D of 40 ng/ ml or more were directly related to bone mineral density (Holicks 2007)

Hypothetical Question: 4

Clinical symptoms of Vitamin D deficiency (When should the patient be referred for vitamin D evaluation)

Clinically when patient complaints of non specific musculoskeletal pain, fatigue, non radicular back pain, arthralgias, proximal muscle weakness, head ache, insomnia, myalgia altered mood and depression, the patient should be suspected with for vitamin D deficiency (Qamar Khan 2010), however systemic involvement as in auto immune disorders, secondary hyper parathyroidism, peripheral artery disease, irritable bowel syndrome (IBS), and depression are other few conditions may have low vitamin D should be considered and referred to physician (Nicololness *et al* 2010). Above said two students supports the need to refer for physicians advice as done by the author of this report.

Major Implications of this case study findings

1. Analyse clinical physical reactions of the patient with exercise therapy
2. Use evidence based practice with nature of medical history, occupation, level of sunlight exposure
3. Prefer to refer for medical advice

- This practice strives to improve self confidence of the therapist, promote evidence based physiotherapy uphold professional standard and excellent health care delivery.

CONCLUSION

Pain, muscle weakness, when treated with physical exercises, resulting in poor prognosis, clinical therapist should consider various factors including vitamin D levels, hence with sue evidence based means of clinical practice, quality of healthcare with physiotherapy using scientific ways is ensured is the core of this original study reported.

Limitations of this study was single case report hence recommended screening of larger sample size of population with vitamin D evaluation to be studied with longer duration follow up after administration of vitamin D are recommended.

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