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Case Report

Adapted Reflextherapy to Relieve Chronic Headaches after Whiplash Injury: A Case Report

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Abstract

We have previously reported on applying peripheral dermal pressure in whiplash injury disorders using Adapted Reflex therapy (AdRx) [1,2].

The aim of this case study is to report outcomes in a patient with a 5-year history of chronic headaches after whiplash injury in a road traffic accident (RTA). It is commonly accepted that a whiplash injury is described as a Whiplash Associated Disorder (WAD) when multiple symptoms persist after a grade II whiplash injury [3].

Background: Chronic headaches are frequent symptoms after an acceleration/deceleration incident involving the neck (whiplash) in a car accident. It is notoriously difficult to find a therapy to relieve symptoms from WAD.

Subject: 26-year-old female physiotherapist (FP) with a 5-year history of daily cervico-occipital headaches since an RTA where she was the driver.

Additional signs and symptoms: reduced cervical mobility, reduced straight leg raise (SLR), limited forward lumbar flexion, intermittent unilateral pins and needles lower limb, cervical eczema.

Outcome Measures: Daily pain; cervical mobility; SLR; Quality of Life.

Method: Adapted Reflex therapy (AdRx) - a high specificity foot treatment akin to reflexology.

Outcomes: 60% reduced intensity and frequency of headaches; increased cervical flexion/extension; improved SLR; reduced pins and needles.

Cervical rotation and side flexion remained unchanged.

Improvements maintained at 3- and 12-month follow-up.

Reflection: Whiplash injury causes disturbance to the intricate workings of the nervous system resulting in intractable pain patterns. Gentle massage to the skin stimulates production of oxytocin which reduces nervous system hyperactivity [4]. The author suggests a link between the application of peripheral touch and reduction of headaches whereby an action potential creates a central activation which ultimately reduces pain by modulation of central hypersensitivity by nociceptive input [5].

***Keywords**: Chronic Headaches; Pain; Whiplash Injury; Whiplash Associated Disorder; Adapted Reflextherapy*

Purpose

The purpose of this case report is to present a service evaluation of an unconventional method of treatment in a 26-year-old female suffering from a 5-year history of chronic headaches after a reported whiplash injury from a road traffic accident while driving a car. Outcome measures and a patient satisfaction narrative of receiving AdRx in a prospective experimental treatment for chronic headaches post-injury are presented. The trial was arranged by mutual agreement and aimed to satisfy professional curiosity. The report describes the treatment method, Adapted Reflex therapy (AdRx) [6], used to facilitate change in persistent post-whiplash injury symptoms including WAD.

Introduction

There is no known treatment which resolves chronic pain after a whiplash injury [7]. Moore., *et al.* define chronic pain as a specific pain in excess of 3 months [8] while Curatolo defines chronic pain as ongoing pain after a whiplash injury when symptoms have persisted in excess of 12 months [9]. By this time, a 'single' whiplash injury has become a 'WAD', Whiplash Associated Disorder, with multifaceted symptoms, and the prospect of full recovery is less likely. In terms of tissue physiology, Meyr and Saffran suggest a different treatment approach in 'chronic' pain states because 'acute' pain has changed from *physiology* to *pathophysiology* which dictates and demands an alternative approach [10]. It has been found during the last two decades that, by adopting AdRx as a method of treatment for WAD, encouraging outcomes have been observed in chronic pain states [11,12]. This case report confirms previous findings in respect of headaches, SLR, cervical mobility and the patient's narrative.

Subject

A 26-year-old female (FP) volunteered to undergo a prospective treatment using AdRx, having suffered chronic headaches for 5 years after a whiplash injury.

FP described her headaches starting from the occiput radiating towards the right (R) eye and caudally to the ipsilateral scapula since her accident. She had episodes of dizziness when looking upwards during 'sitting' and 'standing' procedures. There was increased head pounding during running activities and bilateral pins and needles in the upper limbs and (R) foot. In addition, FP reported heart palpitations, eye and ear symptoms, and frequent sleep disturbance which she ascribed to the whiplash injury. She described 'pain' as 'moderate' to 'severe' which increased during car journeys. Symptoms had worsened in the last 6 months.

Previous Medical History: Skull fracture aged 3. Occasional headaches from age 10. A second car accident one year before commencing AdRx treatment.

Pharmaceutical approaches and physiotherapy treatments had offered limited relief.

Recruitment

FP and the author worked as colleagues in the same NHS outpatient physiotherapy department. By chance, FP was introduced to AdRx during a 2-day in-service training course run by the author. FP volunteered to be 'the patient' during one of the course demonstrations. After this practical introduction, FP expressed an interest to 'try' a course of treatment to relieve her headaches. It was decided to do a 'prospective single case study' from the findings. Approval was granted by the physiotherapy manager.

Clinical observations

The initial assessment identified 'limited cervical range of motion in all ranges', 'moderate to severe levels of pain' and 'reduced bilateral straight leg raise (SLR)' [13]. A 'patient narrative' describes the patient's experience of receiving an unorthodox treatment for chronic pain and changes in 'Quality of Life' before and after the treatment period.

Methodology

AdRx, a foot treatment akin to reflexology, has been reported to facilitate symptoms and quality of life in patients with chronic neck pain after whiplash [14,15]. Light finger pressure is applied by the therapist on specifically selected areas on the medial arches of the feet (Figure 1).

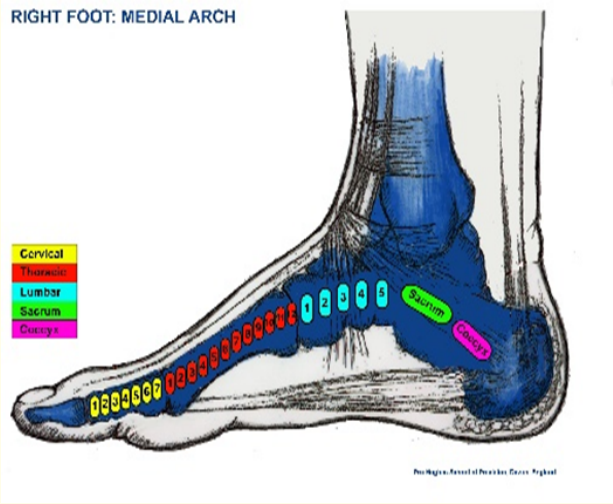

Figure 1: *Medial arch of right foot. Areas of reflex points related to spinal segments.*
Acknowledgement: Prue Hughes School of Reflexology, Devon; Jan Williamson: "Precision Reflexology".

AdRx was developed by the author over two decades ago highlighting a treatment of choice in whiplash injury and musculoskeletal pain. AdRx hypothesises that a compromised neural system plays a role in maintaining pain after minor and major injury. It is proposed that central neural mechanisms lack ability to provide the necessary 'top-down' inhibitory (descending flow) peptidal flow, to inhibit onslaught of incoming pain messages, after injury; see Bannister and Dickenson [16]. However, it has been found that by applying dermal pressure on areas of the feet (ascending flow), predictive responses in musculoskeletal pain after injury have been achieved on numerous occasions. It is hypothesised that inhibitory activity is resumed and can be monitored and regulated by the direct dermal input.

The findings suggest a relationship between peripheral input (on the feet) and higher centres creating a reaction of 'counter-irritability' at spinal or higher centres between ascending and descending action potentials.

The supporting hypothesis of AdRx assumes activation of an action potential in dermal nerve endings which transmit to higher centres via the spinal cord. The descending response mechanism acts as a 'counter-irritant' subjecting anatomical structures to a different coding system initiating a varied activity [17].

Multiple regions can be treated during one therapy session. Duration and pressure depth is primarily determined by level of 'irritability' and 'sensitivity' to touch at the initial assessment and consequent treatment episodes. Additional areas of tenderness may be found at subsequent examinations of the feet in which case they are treated in the same manner. The principles of AdRx were developed over many years from observations in treating patients with musculoskeletal pain after whiplash.

Treatment

AdRx is a task-specific therapeutic intervention applied by manual pressure on the feet using a selection of handhold techniques (Figure 2).

Figure 2: *3-point AdRx at T12 level (1 of 5 handholds in AdRx). Photograph by Clarissa James.*

The patient lies on a treatment couch with 1 - 2 pillows under the head. A pillow under the knees provides increased comfort. The therapist sits on a mobile chair at the end of the bed facing the soles of the patient's feet.

Treatment is applied to feet areas found to be sensitive and immobile on the foot at each treatment episode which are subjected to continuous light pressure for approximately 30 - 60 seconds and fully completed within 10 minutes. In the case of FP, a total of 6 treatments were carried out over 8 weeks to assess a therapeutic effect [18]. The treatment was carried out during the lunch hour in the physiotherapy department where FP and the author were employed. Relevant outcomes measures were carried out pre- and post-treatment. FP returned to work in the department after each treatment. No contact medium was used. A telephone enquiry with regards to the outcomes was carried out 3 months and 12 months after finishing the treatment.

Outcome measures

Three quantitative outcome measures were applied:

1. Cervical spine excursion
2. Self-reported pain levels
3. Straight leg raise (SLR).

One qualitative outcome was used to assess quality of life in the form of a *narrative* report.

Results

1. Cervical mobility:
    - Forward Flexion: 40^0/ 70^0
    - Extension: 55^0/ 60^0

Overall impression

- Improved forward flexion of cervical spine.
- Mild improvement of extension.
- No change in rotation and side-flexion.

Cervical range of movement was measured using a cervical range of movement instrument (CROM) (Figure 3) while sitting on a wooden (and therefore firm and stable) chair [19,20].

Figure 3: *Model wearing the CROM head measure.*

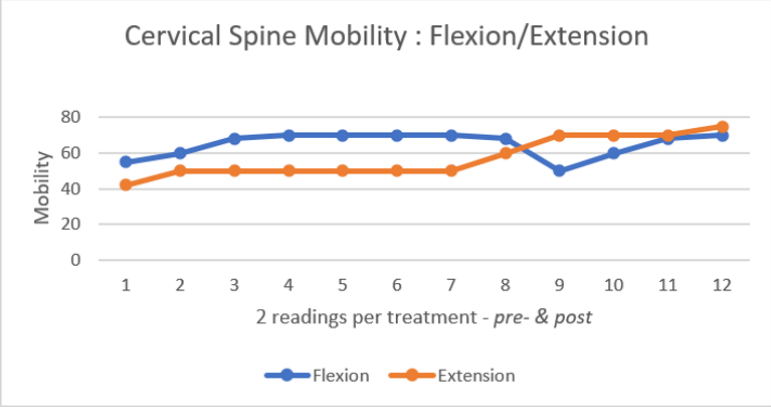

Diagram 1: *Cervical mobility.*

Blue: flexion/ Orange: extension.

Pain levels

Self-reported pain diary using a Visual Analogue Scale (VAS) plotted as a weekly scattergram (Diagram 2).

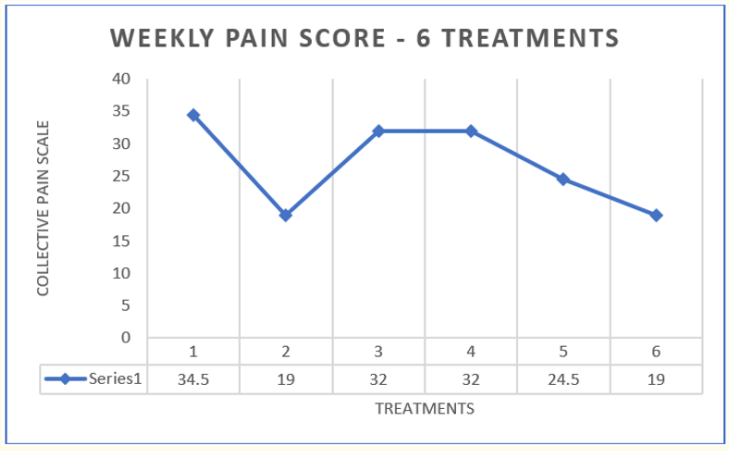

Diagram 2: *Pain levels - 6 treatments (8 weeks).*

The table below explains the pain scores in more detail. Treatments were always on a Tuesday so FP scored her pain daily on each of the days after a treatment. It is common for pain to increase on the first day after a treatment, which explains why the pain scores on Wednesdays were higher than on subsequent days.

Treatment (6 in total)	Daily Pain Score, Days 1–7							Total Weekly Score
	1 Wed	2 Thur	3 Fri	4 Sat	5 Sun	6 Mon	7 Tue	
1	6	4	5	8	7	2	2.5	**34.5**
2	4	2	3	4	4	1	1	**19**
3	9	8	7	0	0	3	5	**32**
4	5	4	4	4	7	4	4	**32**
5	5	2	1.5	2.5	5	4.5	4	**24.5**
6	3	7	2	5	1	0.5	0.5	**19**
	32	**27**	**22.5**	**23.5**	**24**	**15**	**17**	

Table 1

There were 6 treatments over 8 weeks.

Pain scores week 1: **34.5** (6,4,5,8,7,2,2.5)

Pain scores week 8: **19.0** (3,7,2,5,1, 0.5, 0.5)

These total weekly scores show that over the 6 treatments (8 weeks), pain levels decreased.

Overall impression

A linear pain decline over time.

Reduced pain levels maintained 3 months after therapy.

Pain levels varied daily.

Straight leg raise (SLR)

SLR is a neurodynamic test of sciatic nerve tension. It raises questions of a possible upregulated central nervous system (CNS).

The patient lies in a supine position. With the knee in full extension and the hip at neutral position, the leg is raised until posterior leg pain or resistance interrupts the motion. Hip flexion is measured using a goniometer. Normal movement is 80 - 90^0 hip flexion without pain. Radiating pain at the back of the leg is indicative of neural irritation.

SLR

Pre- and post-measure 6 treatment, 8 weeks:

1st treatment: (R) SLR **35^0 – 80^0**

(L) **55^0 – 70^0**

6^{th} treatment: (R) **70^0 – 80^0**

(L) **75^0 – 80^0**

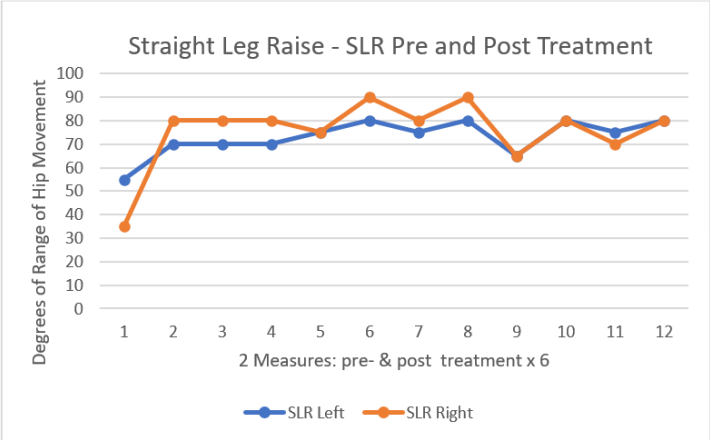

Diagram 3: *Straight leg raise.*

The graph shows marked increase of SLR after the 1st treatment in (R) l > (L) leg which was maintained until the end of the 8 weeks. At 3rd and 4th treatment the SLR increased to 90^0 temporarily.

Overall impression

SLR of (R) leg shows **considerable** improvement after 1st treatment.

SLR of (L) leg shows **moderate** improvement after 1st treatment.

Both legs remain within **normal** range of hip flexion after 6 treatments.

Quality of life – a patient narrative

The following is FP's account of receiving AdRx in the context of chronic headaches.

Adapted reflextherapy

My knowledge of Adapted Reflextherapy (AdRx) was very limited before taking part in this case study and initially I was unsure of the effects it could have on the autonomic and neural system as well as the musculoskeletal system. I attended one day of the AdRx course by Gunnel Berry, covering the mechanism of reflextherapy and the way the various points of the feet correspond to the rest of the body.

As a Physiotherapist, I have treated patients with hypersensitivity over the painful areas, making most manual techniques very painful with poor results. With reflextherapy, the painful area is treated indirectly and therefore causing the patient less discomfort. Another very useful aspect of this technique is the ability to detect other areas of the body contributing to the pain of dysfunction through the feet and then this can be confirmed with normal physiotherapy assessment.

I have suffered with daily headaches for a number of years and tried a variety of treatments approached previously including neck mobilisations and exercise, acupuncture, homeopathy and changes to diet, all of which had little or no benefits. I was therefore very keen to try Adapted Reflextherapy. The initial subjective assessment was very thorough, going right back to childhood injuries and not focusing only on events since the headaches started. A physiological assessment of posture and range of movement followed with straight leg raise as an outcome measure.

Assessment through the foot is not painful or invasive and I was able to lie comfortably on the plinth supine and observe the technique. When a point of tension or change is found on the foot, there is a sharp acute pain over the area but it does not last long and is not extremely uncomfortable. When being treated over some points such as the lumbar spine and pelvis, there is a feeling of warmth in the areas while it is being treated through the foot.

Following my initial treatment session, I was amazed at the dramatic improvement of 55 degrees in my straight leg raise after about 10 minutes of treatment. Throughout the course of the treatment I kept a pain diary in a graph form, recording my pain score daily, which allowed me to see any patterns. I also noted down activities that have aggravated my headaches in the past, such as climbing, so higher scores could be accounted for.

I had a total of six sessions of AdRx. Once weekly for four weeks and then fortnightly for the last two sessions. Over the course of the treatment, I noted a reduction in the intensity of pain and following this a reduction in the frequency. For the first time in five years, I was not suffering a headache every day and the pain was less intense

Over the past few months since treatment finished, I have still found and improvement in the frequency and intensity of headaches. I still suffer with headaches but at a frequency of 2 – 3 times a week and scoring only 5/10 maximum and no longer require pain medication as often. The improvement in my straight leg raise has been maintained and my initial symptoms of pins and needles in my right foot after 10 minutes of driving has improved and now only occurs after one hour of driving.

Another symptom, which occurred over the same period as headaches, is eczema and itchiness around my right ear. There has been a definite improvement in this along with reduced headaches but it has not yet fully resolved.

Being treated with AdRx is a gentle, non-invasive technique and proved very effective for me where other treatment options have failed.

Discussion

Chronic pain remains a riddle and continues to challenge therapists in terms of rehabilitation and finding efficacious treatments. Meyr and Saffran write that "Chronic pain is an area in which the field of medicine is failing to offer the best possible care to patients" [21].

Patients who seek help in physiotherapy departments are desperate for pain relief. To date there is no known therapy which reduces chronic pain reliably after a whiplash injury or WAD.

This case report, albeit subject to bias with the author being the therapist and assessor, demonstrates a WAD patient who found relief from continuous headaches after 5 years and reports satisfaction of receiving an alternative therapy. Colleagues working side by side may feel an obligation to confer approval of a treatment. Yet, in a professional setting objectivity is paramount for honest outcomes of treatment.

How can this come about? How is it that a peripheral application can possibly change symptoms 5 years later? There is no known answer other than that action potentials submit information details to the brain within context of its neural plasticity capacity. The outcome is a change within its innate content and moderation. Similar outcomes have been observed and measured in hundreds of patients with a similar history. The hypothesis is that by sensory touch, an action potential triggers a descending action potential in the thalamus prior to decussation. It is remembered that ascending messages pass via the thalamus for transmission to higher centres including the cerebellum, cerebrum and limbic areas linking all areas of the brain including the autonomic nervous system which affects the ascending potentials at spinal cord level. Furthermore, it is surmised that action potential loops within the central core of the spine itself such as at the Clarke's column affect the ultimate activity of descending mechanisms. Limited knowledge of these interconnections reduces our complete understanding of neural activity after spinal injury. By employing enigmatic and unorthodox treatments based on clinical observations and patient satisfaction, they may offer a pathway to relieve persistent pain in musculoskeletal pain conditions.

Key Message

Chronic pain is an enigma yet we are confronted with it on a daily basis in clinical practice. I have found AdRx an effective approach in the management of chronic pain. It appears to challenge neural plasticity with regards to neurodynamical adaptations and chemical responses after injury and healing processes in acute and chronic injuries. The key message is to confront and appeal to brain function and cellular memory to alter its activity in order to reduce chronic pain states. A simple intervention like 'touch' may be just enough to utilise the sensory afferent system to boost a compromised inert nervous system.

Acknowledgement

I extend my sincere thanks to my colleague who volunteered to try out a new treatment for her chronic headaches. Further thanks are extended to our outpatient physiotherapy manager who permitted the use of an unorthodox method of treatment as well as offering to run 'in-service' training in AdRx in the department.

Declared Interest

The author is the founder of the concept and hypothesis of Adapted Reflextherapy since the start of this millennium.

AdRx was voted an ancillary therapy to Reflex Therapy by ACPIRT (the Association of Chartered Physiotherapists in Reflex Therapy) in 2010. Since March 2021, the Chartered Society of Physiotherapy, UK, no longer support the use of complementary therapies. Nevertheless, reflextherapy practice is permitted with an explanation to the patient that it is a 'complementary therapy' rather than being part of physiotherapy practice.

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