The Chiropractic Report

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Professional Notes

Evidence and Bias

Conscious and unconscious bias are constantly present in interpretation of the scientific literature. A new article on the evaluation and treatment of patients with acute low-back pain just published in the *American Family Physician* illustrates this once more.

In November 2004 the UK Back Pain Exercise and Manipulation (BEAM) Trial was published in the *British Medical Journal*. This was a large (n 1334) multicentre trial sponsored by the British Medical Research Council and designed to test whether the addition of skilled manipulation and/or exercise to "best medical care" gave superior results for patients with uncomplicated low-back pain. Patients were recruited from 14 family or general medical practice centres across the UK.

Each of manipulation and exercise produced statistically significant improvements over best medical care with manipulation producing the best results – statistically significant improvement

continued on page 4

Chiropractic Management of Hypertension

New Trial Provides Convincing Evidence of Effectiveness

A. Introduction

A NEW CLINICAL TRIAL FROM the Rush University Hypertension Center in Chicago, published in March in the *Journal of Human Hypertension,* reports that chiropractic upper cervical adjustment to correct the position and function of the atlas vertebra can significantly lower blood pressure in patients with Stage-1 hypertension.[1]

The chiropractic technique studied "has the effect of not one but two blood pressure medications given in combination" says principal investigator Professor George Bakris, Director of the Rush University Hypertension Center, interviewed online by WebMD.[2]

"And it seems to be adverse-event free. We saw no side effects and no problems".

"When the statistician brought me the data, I actually didn't believe it. It was way too good to be true," continues Bakris. "The statistician said 'I don't even believe it'. But we checked for everything, and there it was".

For 50 patients with early stage high blood pressure:

- Those in the treatment group had significantly lower blood pressure than the similar patients in the placebo or sham chiropractic adjustment group. In comparison with the sham-treated patients, those who received the trial treatment showed an average 14 mm Hg greater drop in systolic blood pressure (the top number in a blood pressure count) and an average 8 mm Hg greater drop in diastolic blood pressure (the bottom blood pressure number).
- X-rays confirmed that the treated patients, but not those in the sham group, had the atlas vertebra realigned following one or more chiropractic adjustments.
- Results were maintained the 8 week study period.
- None of the patients took blood pressure medicine during the 8 week study, none of them had any adverse events.

2. There have been many case reports and preliminary studies suggesting that chiropractic manipulation to correct spinal problems – in both the cervical and thoracic regions of the spine – may be associated with reduced hypertension. On the basis of animal and human experiments various mechanisms of action, reasons why this may be, have been advanced. However this new study is the first double-blind randomized controlled trial (RCT) in its field.

This issue of The Chiropractic Report therefore looks at the trial in some detail. There is then a review of the other evidence and the significance of this for patients and the profession. We start, however, with a brief review of the anatomy of the upper cervical spine and the immediate background to the new trial by George Bakris, MD from the Pritzker School of Medicine, University of Chicago, Marshall Dickholtz, DC from the Chiropractic Health Center, Chicago and their co-investigators from the University of Chicago and the Barrington Family Medical Clinic in Barrington, Illinois.

B. Anatomy and Background

3. The atlas vertebra (C1), as shown in Figure 1, is positioned immediately under the skull or occiput and at the top of the cervical spine and vertebral column. All other vertebrae interlock with each other at the two zygapophyseal or facet joints at each level. However the atlas, unlike them, has no such locking mechanism and relies upon the soft tissues to maintain alignment and position – the numerous muscles and ligaments

connecting the skull to the atlas and upper cervical spine. This makes the atlas more vulnerable to displacement than other vertebrae, especially given the weight of the head.

The atlas is positioned around the top of the spinal cord and just below the lower brainstem (medulla oblongata) which is shown in Figure 2. This means that minor misalignment of the atlas, as Bakris, Dickholtz et al. point out in their new study, has the potential to compress and compromise neural pathways and associated arteries in the spinal cord and brainstem.

4. A relationship between hypertension and abnormalities in the circulatory/arterial system in the area common to the atlas and brainstem has been known to medical researchers for over 40 years. Jannetta et al.[3] observed arterial compression of the medulla oblongata in 51 of 53 (96%) of hypertensive patients who were undergoing crainiectomy and microvascular decompression surgery for unrelated problems. There was no such compression in normotensive patients. As the result they performed vascular decompression of the medulla in 42 of the hypertensive patients – and this reduced the hypertension for the great majority (32 or 76%).

This and other studies treating hypertension with microvascular decompression, recently reviewed by Levy, Scarrow et al.,[4] make it clear according to Bakris, Dickholtz et al. that there is a subpopulation of hypertensive patients that have 'neurogenic hypertension'. Using magnetic resonance imaging (MRI), Akimura et al.[5] evaluated the relationship between the medulla (ventrolateral surface) and the vertebral arteries and their branches in hypertensive patients and normotensive controlled subjects. They found arterial compression in 90.6% of the 32 hypertensive cases, but no significant compression in control subjects. From these and other studies mentioned, Bakris, Dickholtz et al. conclude that "changes in the anatomical position of the atlas vertebra and resultant changes in the circulation of the vertebral artery lend itself (sic) to worsening of hypertension."

It was against this background that they designed their trial. They accepted that anatomical abnormalities of the upper cervical spine at and around the level of the atlas vertebra "are associated with the relative ischemia of the brainstem circulation and increased blood pressure", and the goal of their study was to see if a specific chiropractic approach to correction of the position and function of the atlas would lower blood pressure and, if so, whether results would be sustained over a longer term. They chose an 8 week period.

The criteria used to establish whether or not the chiropractic treatment produced an anti-hypertensive effect were those defined by the US Food and Drug Administration for approval of a new anti-hypertensive drug – in essence a double-blind randomized, controlled trial or RCT demonstrating a reduction in diastolic blood pressure (BP) of 5 mm Hg or more greater than any reduction in a placebo group, and with freedom from serious side effects.

C. Bakris, Dickholtz et al Trial

5. **Patient Population and Inclusion criteria**. Subjects in the trial were patients attending a specialized hypertension clinic at the University of Chicago on medical referral. Necessary criteria for admission to the trial included:

a) Age 21-75 years

b) A documented history of Stage-1 hypertension

c) Positive screening for preliminary evidence of misalignment of the atlas vertebra through a chiropractic, supine, leg-length check protocol. (With the patient lying face upwards and with head turned to the left and/or right, observation of functional leg length differences at the heels.)

Accordingly, and most significantly, this was not a population of patients with hypertension – it was a subpopulation of those patients who also had evidence of a chiropractic spinal lesion or subluxation.

6. **Exclusion Criteria.** These included:

a) Negative results from screening with the supine, leg-length check.

b) Stage-2 or higher hypertension and/or a prescribed regimen or two or more anti-hypertensive medications. Patients attending the Hypertension Center were computer randomized into treatment and control groups and then removed from/washed out of their current BP medications for the two week period before the main study began. Patients whose BP exceeded 159/99 mm Hg on two separate visits during this time were excluded.

7. **Trial Intervention.** Patients in the treatment group received chiropractic adjustment of the atlas to restore its normal position according to the technique and protocol of the National Upper Cervical Chiropractic Association (NUCCA). This approach to management, more fully described in the paper, involves a series of precise external forces/nudges by hand that cause the atlas to recoil into a different and more normal alignment – the vertebra being more centrally located and without rotation. One assessment and treatment visit per week for 8 weeks was scheduled, but 21 of the 25 patients (85%) only needed one treatment to reposition the atlas as required for the 8 week period.

Patients in the placebo or control group received a sham manipulation designed

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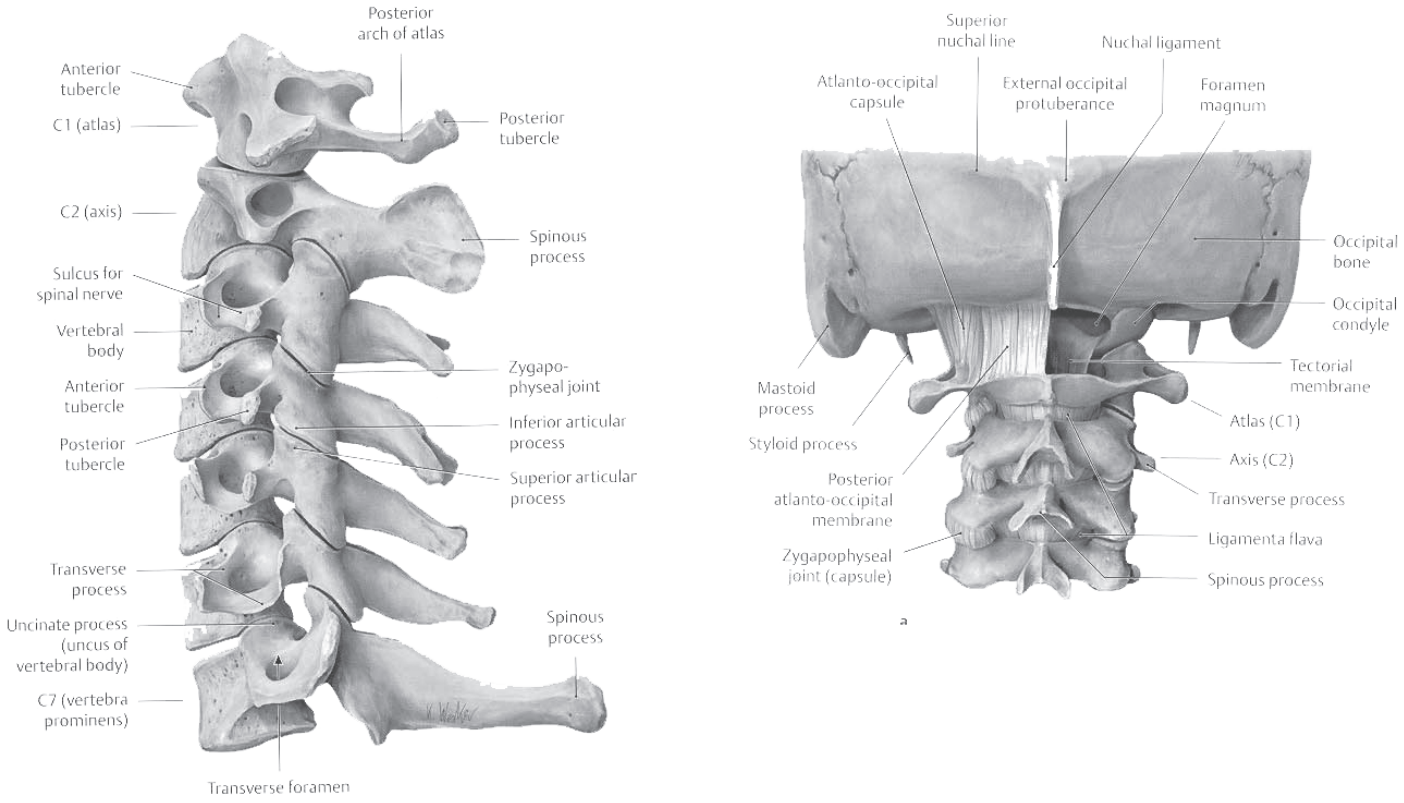
Figure 1. Lateral and Posterior-Anterior Views of the Upper Cervical Spine and C1 (atlas) Vertebra)



Courtesy of Thieme, *Atlas of Anatomy*, 2006.

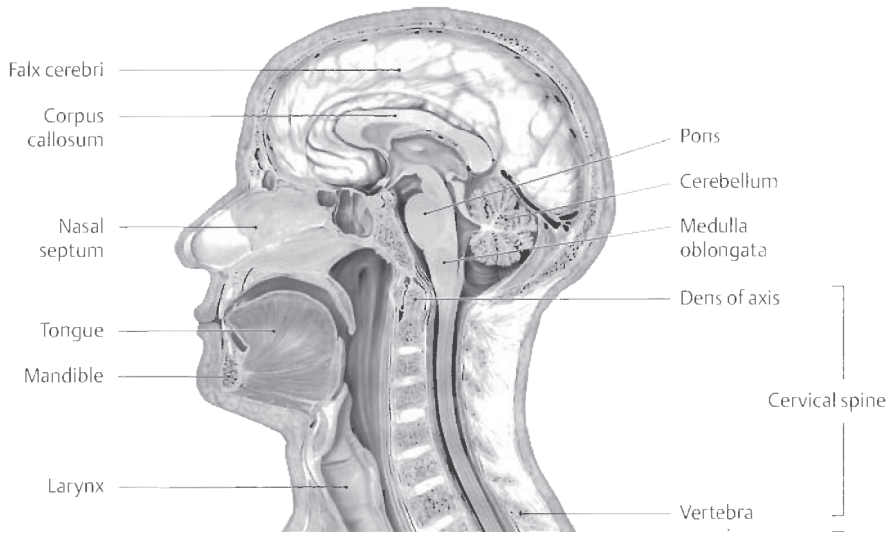
to be indistinguishable from the real procedure. This was possible because the NUCCA technique calls for exact positioning for both the patient's head and the practitioner's hands. For the sham group both the patient's head and the chiropractor's hands were intentionally misplaced – but otherwise the technique looked and felt identical to the real treatment.

NUCCA technique, like other chiropractic upper cervical techniques such as orthospinology and atlas orthogonal, has a combination of postural and radiological assessments to determine atlas misalignment, the vectors of the precise adjustment required, and subsequently the results of treatment. In NUCCA these are:

a) Postural assessments – supine, leg-length check; paracervical skin temperature measurements; postural analysis by an anatometer (which includes left and right weight-bearing scales and devices

continued on page 6

Figure 2. Lateral View showing Upper Cervical Spine, Brainstem (Pons and Medulla Oblongata) and Spinal Cord



Courtesy of Thieme, *Atlas of Anatomy*, 2006.

Evidence and Bias

continued from page 1

over best care at both 3 months and 12 months on various pain, disability and other measures. The multidisciplinary team reported that ". . . this is the first study . . . to show convincingly that both manipulation alone and manipulation followed by exercise provide cost-effective additions to best care (for low-back pain patients) in general practice."

It is more than surprising, therefore, to find the BEAM trial given as an authority for the proposition that spinal manipulation is not effective in a new review in a reputable journal. "Spinal manipulation was not found to be effective" says Scott Kinkade in his major review of management of patients with acute low-back pain published on April 15 in the *American Family Physician*, official journal of the American Academy of Family Physicians.

Kinkade acknowledges that lumbar spinal manipulation is generally safe when provided by an appropriate practitioner, is used by many patients, and produces short-term improvements in pain and function compared with sham and various other less effective treatments. However, on his interpretation of the BEAM trial and other evidence he reassures family physicians that it provides no benefits in comparison with "usual care treatments (i.e. family physician provided care, analgesics, physical therapy or back school)."

We must hope that family physicians will turn to unbiased evidence-based clinical guidelines developed by multidisciplinary panels – which, on the basis of the BEAM trial and other evidence, recommend skilled manipulation - rather than one of their own misrepresenting the evidence and telling them that they have all the necessary answers. (Kinkade S (2007) *Evaluation and Treatment of Acute Low Back Pain,* Am Fam Physician 75:1181-1188, 1190-1192).

(UK BEAM Trial Team (2004) *United Kingdom Back Pain Exercise and Manipulation (UK BEAM) Randomised Trial: Effectiveness of Physical Treatments for Back Pain in Primary Care,* BMJ 329:1377).

Other Research

1. **Denmark – An Active Lifestyle Prevents LBP in Seniors.**

Danish researchers Jan Hartvigsen, DC PhD and Kaare Christensen, MD PhD, who refer to earlier research demonstrating that "low-back pain is one of the most common pain conditions in older populations . . . and may exert a major impact on the daily lives of sufferers", have a new two-year prospective study of 1,387 seniors aged 70-100 years. They report that an active lifestyle consisting of regular (once a week or more) long walks, bicycling, heavy gardening, dance, gymnastic and/or other exercise significantly reduces the risk for seniors in developing back pain.

And it is never too late to start – the preventive effect of regular strenuous exercise "was very strong in persons with an initial physical function (strength score) below average."

In this population 83% were engaged in light physical activity, but 42% of men and 35% of women engaged in more strenuous physical activity at least weekly. This was "strongly protective" with respect to having any LBP during the two year study, and with respect to having LBP lasting more than 30 days in total during the past year.

The paper starts with a most useful review of the "myriad of health benefits" enjoyed by seniors with an active lifestyle – "ranging from a lower risk of cardiovascular diseases, decreased incidence of Type II diabetes, decreased bone density loss, decreased risk of several cancers, better quality of sleep, and better cognitive function, including a lower risk of depression and dementia."

(Hartvigsen J, Christensen K (2007) *Active Lifestyle Protects Against Incident Low Back Pain in Seniors: A Population-Based 2 Year Prospective Study of 1387 Danish Twins Aged 70-100 Years*, Spine 32(1):76-81.)

2. **Canada – PT Training in Manipulation**

The last issue of this Report described limited education in and use of manipulation, as opposed to mobilization, by physiotherapists in South Africa and the UK. A 2001 survey in Canada by Li and Bombardier showed a similar picture in the Province of Ontario, and that only 5% of physiotherapists were using manipulation for patients with acute low-back pain.

A newly published editorial in *Physiotherapy Canada* by Huijbregts and Young explains why – a survey of 10 of the 11 English-speaking physiotherapy schools in Canada confirms that only three include manipulation (thrust techniques) in the curriculum. The performance of thrust techniques, and assessment of when and how they should be applied, generally remain postgraduate skills taught in courses sponsored by the Orthopaedic Division of the Canadian Physiotherapy Association.

(Li LC and Bombardier C (2001) *Physical Therapy Management of Low Back Pain: An Exploratory Survey of Therapist Approaches*, Physical Therapy 81(4):1018-1028).)

(Huijbregts P and Young S (2007) *Adding Spinal Thrust Manipulation to Entry-Level Canadian Physical Therapy Curricula: Why and How?* Physiotherapy Canada 59(1):1-4).

Spotlight on Europe

European Chiropractors' Union. The ECU, representing 18 national associations in Europe, was founded in 1932 and this year celebrates its 75th anniversary. For this it has commissioned a History of Chiropractic in Europe to be presented at the major celebration – the ECU's 75th Anniversary Convention being held this month from May 17-19 in Vilamoura, Portugal, together with the World Federation of Chiropractic's 9th Biennial Congress.

The ECU goals, given fully at its website www.chiropractic-ecu.org, include achieving and harmonizing legislation across Europe, establishing fulltime university-based education programs, and representing the profession within the European Union. The ECU has had, and continues to have, major successes in achieving these goals. In many European countries the number of chiropractors in practice has more than doubled

during the past decade and there are now approximately 5,000 chiropractors in the region.

Current President is Dr. Philippe Druart of Belgium and Vice-President is Dr. Stathis Papadopoulos of Cyprus. Immediate Past-President is Dr. Peter Dixon of the United Kingdom. Anyone wanting information about chiropractic in European countries, or wanting to locate a European chiropractor can find extensive information at the ECU website.

France. France presents a fine example of the international growth of the chiropractic profession. Ten years ago the practice of chiropractic was illegal, chiropractors were being prosecuted for practising medicine without a licence, and the profession remained small and divided.

Today the Association Française de Chiropratique (AFC) has almost 300 members. Many of its leaders, including President Dr. Philippe Fleuriau, are graduates of a now well-established chiropractic college in Paris, the Franco-European Institute of Chiropractic (IFEC). IFEC now has 380 students in its six year accredited program and impressive facilities. Students take dissection courses at a nearby medical school at the Faculty of Medicine at the University Saints Pères, and clinical training includes rounds in a number of area hospitals.

Recently the AFC, the professional organization, and IFEC, the school, have been joined by the Franco-European Society of Chiropractic (SOFEC) which is now the scientific and research arm of the profession in France. This progress has followed the French government's decision in March 2002 to give legal status to the practice of chiropractic. A full system of licensure has not yet been established under the new law but good progress is being made, especially following a recent visit of French Ministry officials working on regulation to the National University of Health Sciences in Chicago.

Ireland. The Chiropractors' Association of Ireland (CAI), founded in 1983 and now with approximately 175 members, continues with its campaign for legislation to regulate chiropractic practice in Ireland – at present practice is legal but not regulated. The CAI is a good example of a small association with limited resources doing fine work to promote the profession in its country and internationally. A visit to the CAI website www.chiropractic.ie demonstrates effective use of the World Federation of Chiropractic's agreed market identity and participation in the international Straighten Up movement through the Straighten Up Ireland program.

Norway. The chiropractic profession is well-established and respected in the Scandinavian countries – Denmark, Finland, Iceland, Norway and Sweden – where it is seen as an integral part of the mainstream health care system. This is particularly so in Norway under the leadership of a strong Norwegian Chiropractors' Association (NCA) which has promoted good interprofessional relations and an identity of neuromusculoskeletal expertise during the past decade.

Following a pilot project in 2002-2003 which demonstrated the cost-effectiveness of chiropractic care, there has been government funding for chiropractic services, including diagnostic imaging (plain film, MRI, CT). In the last four years there has been a one-third increase in the size of the profession from approximately 300 to over 400 chiropractors.

Spain. Dr. Belen Sunyer of Madrid, President, Spanish Chiropractic Association (AEQ) reports that plans for the opening of Spain's first school of chiropractic at the Maria Christina Royal University Centre (RCU) at Escorial near Madrid in October, 2007 are on target. RCU and the AEQ have been grateful for assistance from various quarters internationally including the Anglo-European College of Chiropractic, Parker College of Chiropractic, the European Chiropractors' Union and prominent individuals such as chiropractic neurologist Dr. Fred Carrick, President, Carrick Institute and ACA Council on Neurology.

To familiarize Spanish and other chiropractors with the RCU campus, and to create further support for the proposed school, there is to be a two day postgraduate seminar held at RCU June 15-16, 2007.

Switzerland. In 1939 the Canton of Zurich in Switzerland became the first jurisdiction outside North America to pass legislation to recognize and regulate the practice of chiropractic. Switzerland was the first country in Europe to both regulate and provide public funding for chiropractic services, and the Association of Swiss Chiropractors (ASC) has perhaps the most developed continuing professional development requirements and programs anywhere.

Most of the ASC's 260 members received their chiropractic training in North America, but there will be future change with the opening of the new chiropractic school being planned at the University of Zurich, with a program similar to that at the University of Southern Denmark. In Switzerland chiropractic is now viewed by governmental authorities and the health care system as a mainstream health care service – a current major reorganization of federal legislation lists five core health professions: chiropractic, dentistry, medicine, pharmacy and psychology.

United Kingdom. During the past generation the chiropractic profession has become well established within the British health care system and there are now over 2,000 chiropractors in practice and regulated by the General Chiropractic Council under licensing legislation. There is government funding for student tuition fees at the Anglo-European College of Chiropractic in Bournemouth and the Welsh Institute of Chiropractic at the University of Glamorgan, two accredited chiropractic colleges affiliated with public universities and educating students from throughout Europe. A third school, the McTimoney School of Chiropractic in Oxford, is currently seeking accreditation.

The British Chiropractic Association, with approximately 1300 members, has provided strong leadership and direction for the profession. For one example of the quality of its programs, go to www.chiropractic-uk.co.uk and see its Straighten Up UK program – adapted from the US program at www.straightenupamerica.org that was adopted by the International Bone and Joint Decade last year for the annual World Spine Day on October 16.

to measure pelvic distortions, lateral spinal column displacement and head tilt).

b) Radiograph assessments – three views to visualize and measure atlas malposition in three planes/dimensions.

8. **Outcome Measures.** In this trial assessments were made at entry into the study (baseline), after the visit in the first week, and at the end of the 8 week study period. Primary outcome measures were:

a) Change in blood pressure. Readings taken were a mean or average of three cuff measurements while the patient was seated.

b) Lateral and rotational position of the atlas vertebra as demonstrated by x-ray.

In addition heart rate and all the NUCCA postural measures were assessed. In terms of statistical power, the trial was designed to have 90% power for detecting a difference of 10 mm Hg in systolic blood pressure change between the treatment and control groups, with 25 patients in each group and up to 10% loss or drop-out of participants during the trial.

9. **Results**. There were no notable differences between the patients randomly assigned to each group in terms of blood pressure, pulse rate and demographic characteristics (age, gender, race). The quite dramatic trial results at 8 weeks were:

a) A greater mean reduction in systolic BP of 14mm Hg in the treatment group (minus 17) than in the control group (minus 3).

b) A greater mean reduction in diastolic BP of 8 mm Hg in the treatment group (minus 10) than in the control group (minus 2).

c) These reductions in BP were not associated with pain or pain relief or any other symptom that could be associated with a rise in BP.

d) Heart rate was not significantly changed in patients in either group

e) On radiographic analysis there was almost total correction of lateral and rotational atlas displacements for patients in the treatment group after the first treatment, but virtually no change for patients in the control group receiving the sham adjustment. These changes were maintained at 8 weeks, with only 4 of the 25 patients in the treatment group requiring additional treatment within that period.

e) There were no adverse events.

f) Bakris, Dickholtz et al. conclude that "restoration of the atlas alignment is associated with marked and sustained reductions in BP similar to the use of two-drug combination therapy."

The authors comment on the two limitations of their pilot trial – its relatively small number of patients and the fact that all treatment was given by one clinician/doctor of chiropractic – but explain that a larger, follow-up trial is now planned to respond to those limitations. Although the question of how misalignment of C1 affects hypertension and the exact mechanisms of action are not known, Bakris, Dickholtz et al. note the importance of this new evidence supporting the first proven non-surgical and non-medication approach to alleviating high blood pressure "at a time when the prevalence of hypertension is increasing and its control is more difficult" due to a variety of factors.

D. Discussion

10. From the time of BJ Palmer and AA Wernsing in the 1930s, the chiropractic profession has recognized the particular significance of subluxation of the upper cervical spine and specific adjustment or manipulation of the atlas in influencing the central nervous system and, through it, the mechanical and visceral function of the entire body.

Palmer focused on the higher force toggle-recoil technique. Wernsing, also in the 1930s, developed a high-velocity, light-force technique that led to the Grostic/NUCCA techniques practised today. As Cooperstein and Gleberzon explain in their recent text *Technique Systems in Chiropractic*,[6] much of the NUCCA technique as it exists today – the cervical measuring instruments, the pre and post x-ray series, the side posture table, the triceps pull atlas adjustment – were developed by Seemann, Grostic, Gregory and others from Wernsing.

Dr. John D. Grostic, writing in 1998 concerning the ways in which misalignment and subluxation of the atlas can influence the nervous system causing mechanical and visceral dysfunction throughout the body, includes the hypothesis now put forward by Bakris, Dickholtz et al. to explain their hypertension trial results – namely that misalignment and rotation "may reduce or occlude the vertebral arteries, reducing blood flow to the brain and upper cervical cord. They may also cause the cervical cord and medulla to be displaced laterally away from the direction of rotation, allowing the tip of the dens to compress the medulla." [7]

This was one of four physiological mechanisms and rationales put forward by Grostic, the other three being:

a) Trauma to the upper cervical area may result in splinting of cervical muscles, which produces direct mechanical irritation to the nerves passing through these muscles.

b) Tissue edema surrounding the vertebrae can produce direct mechanical irritation of the nerves, arteries and veins passing through the intervertebral foramen and the superior cervical ganglia.

c) The denticulate ligaments may directly exert traction on the spinal cord, interfering with the long nerve tracts by (1) direct mechanical irritation and by (2) closing the small veins of the spinal cord, producing a blood flow stasis and a resultant loss of nutrients necessary for normal nerve conduction. (This last mechanism is Grostic's dentate ligament - cord distortion hypothesis. He felt that, given the attachment of the dentate ligaments to the osseous structures of the upper cervical spine, upper cervical misalignment would distort and irritate the spinal cord.)

But how exactly does atlas subluxation effect pelvic balance and cause leg length changes? Cooperstein and Gleberzon explain it this way:

"NUCCA practitioners believe that the atlas subluxation produces neurological imbalance of the central nervous system, resulting in spastic contracture of the skeletal muscles, because the atlas subluxation would affect the reticular formation in the brainstem. This would in turn bring about a disinhibition of caudal structures, resulting in postural distortion and displacement of the body's center of gravity, one outcome of which could be pelvic distortion and leg disparity".[8]

11. Some chiropractors, including many NUCCA practitioners, focus exclusively on the upper cervical spine. Do the majority of chiropractors, who use other adjustive or manipulative techniques for the upper cervical region and all other spinal joints achieve similar results? Are similar reductions in blood pressure possible when correcting spinal lesions or subluxations in the thoracic spine? Definitive answers to these questions will require controlled trial evidence as strong as that found in the new Chicago study. However, looking at clinical experience and the preliminary research evidence during the past 30 years, the answer is likely yes. In this connection it is noted:

a) In Australia Pollard and Ward have shown in a study with 52 subjects that a standard high-velocity, low-amplitude upper cervical chiropractic manipulation, as given in the commonly used Diversified Technique, improved hip flexion – and did so significantly more than a sacroiliac adjustment.[9] This is evidence to support the principle that upper cervical spine subluxation has postural significance throughout the body, but also that such problems can be identified and corrected under various technique systems in chiropractic.

b) Many case reports of relief of hypertension through adjustment of restricted or malpositioned joints throughout the cervical and thoracic spine include a case that was thoroughly investigated by a judicial inquiry in New Zealand, with expert chiropractic and medical evidence given and findings made and reported. In summary:

i) Mrs. M consulted a chiropractor for neck pain and headache after a whiplash injury, and a course of chiropractic manipulation of the cervical and thoracic spine was successful in relieving her symptoms.

ii) In giving her history Mrs. M had told her doctor of chiropractic that she had been taking daily medication for 15 years for moderate hypertension and a related water retention problem, for which she remained under regular medical care. He had suggested that in response to his treatment the hypertension and edema might improve, with less need for continuing medication. As Mrs. M said at the hearing, she was skeptical of this.

iii) In fact, to the surprise of both her and her family physician, her blood pressure became normal and her anti-hypertensive medication was stopped, and her edema was greatly reduced requiring diuretic tablets once or twice a week rather than daily as previously.

iv) The Commission recognized that no firm conclusions could be drawn in the circumstances. It was left with "facts and probabilities". Could chiropractic manipulation produce a clinical result? The Commission concluded that "the probabilities are that the chiropractic treatment did have the effect both of relieving her hypertension and reducing her dependency on medication."[10]

c) In Canada in a randomized controlled trial with 21 patients, Yates, Lamping et al. examined the effects of chiropractic adjustment of the thoracic spine on blood pressure using an Activator adjusting instrument.[11] Subjects were admitted to the trial if they had blood pressure greater than 130/90 mm Hg and subluxation in the thoracic spine determined by static and motion palpation. Both systolic and diastolic blood pressure decreased significantly in those receiving the trial treatment, whereas there was no significant change for patients in the placebo (deactivated Activator) and control (no intervention) groups. Limitations, however, were the small size of the trial and the fact that only immediate changes were studied – measurements were taken immediately after treatment and approximately 10 minutes later.

d) The thoracic spine is far removed from the atlas vertebra and compression of the brainstem and its arteries. How can chiropractic manipulation of the thoracic spine influence hypertension? The general answer is alteration of the autonomic output to the cardiovascular system. But how will this happen?

One hypothesis is advanced by Budgell and Polus as they report results from their recent controlled trial which demonstrates that chiropractic manipulation of the thoracic spine significantly influences heart rate (HR), heart rate variability (HRV) and autonomic output to the heart in healthy young adults – and in ways not duplicated by a sham manipulation or other physical treatments.[12] They observe:

i) The changes in HRV seen in their trial "implied changes in the balance of sympathetic and parasympathetic output to the heart".

ii) The unique quality of the adjustment/manipulation is a rapid or high velocity thrust.

iii) Animal and human studies suggest that this type of thrust particularly activates muscle spindles, "sensory beds within deep and intersegmental paraspinal muscles whose primary physiologic function may be as sensors rather than as activators of vertebral motion."

iv) If these deep thoracic paraspinal and intervertebral muscles have "a particularly important role in signaling postural change, then, from an adaptive point of view, it is reasonable that they would also have some input into reflex regulation of cardiac function and regional blood flow. This may then explain why, a short-amplitude and high-velocity thrust to the thoracic spine is capable of influencing the balance of autonomic output to the heart."

(Budgell and Polus observe that this hypothesis would also apply to cervical manipulation – cervical muscles have an important role in head movement and are invested with a high density of muscle spindle-Golgi tendon organ complexes)

E. Conclusion

12. The results from the new trial from Bakris, Dickholtz et al., where the chiropractor providing the treatment was Dr. Marshall Dickholtz, a senior practitioner educated at Palmer College in the mid-20th century, represent another exciting affirmation of the central principles and philosophy of chiropractic. These hold that correction of the spinal joint malpositions and restrictions of movement that chiropractors have called vertebral subluxation may result in many improvements in health and well-being as the nervous system reacts and rebalances. For educational purposes the central, peripheral and autonomic branches of the nervous system are studied separately – but their functions are intimately connected.

When the founders of the profession in the early 20th century claimed they could help patients with hypertension – and many other ailments – by identifying and correcting vertebral subluxation, they were ridiculed. When Mrs. M. gave her evidence

to a New Zealand Commission in 1978, with clinical records confirming that her blood pressure had normalized after 15 years exactly at the time she had a short course of chiropractic treatment, "the medical expert's conclusion was there is no justification for the claim that the chiropractic treatment returned Mrs. M's blood pressure to normal". He preferred the explanations of "the variable nature" of hypertension and "other factors" unnamed.[13]

From the 1980s chiropractic researchers began their first serious research into somatovisceral reflexes and clinical management of hypertension, but were hampered by lack of funds and opportunity. Today, at a time that well-designed interdisciplinary research is possible, we finally have the first good evidence to corroborate and support the claims of the early chiropractors –specifically that chiropractic care can assist those patients with mild to moderate hypertension who also have asymptomatic spinal biomechanical lesions – and in a manner that is safe and without need of medication or surgery.

At present, of course, we only have one trial and a beginning – we must await the outcome of further trials including the second and larger trial now planned at the University of Chicago. But to adopt the words of Professor Bakris as quoted on WebMD, these new data from a thoroughly designed trial are so strong they seem "way too good to be true"! TCR

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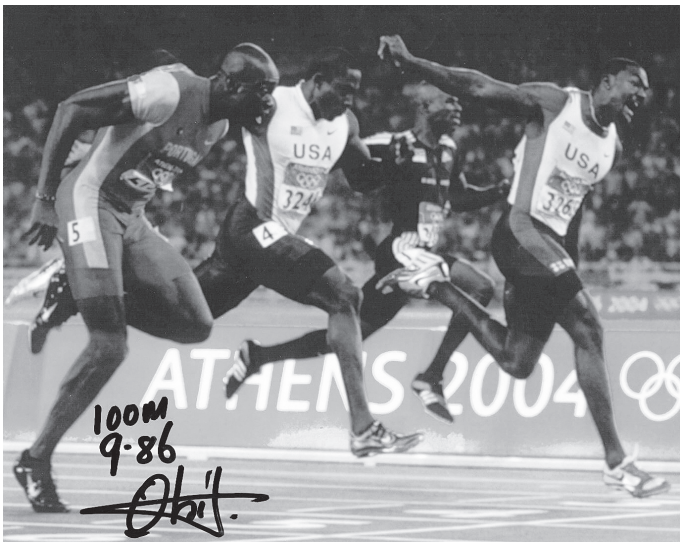

Francis Obikwelu – A Testimony to Chiropractic

One of the guests at the World Federation of Chiropractic Congress and European Chiropractors' Union Convention in Vilamoura, Portugal, this month, will be 2006 European Male Athlete-of-the-Year Francis Obikwelu of Portugal, seen here establishing his European record of 9.86 seconds for the 100 meters while winning the Silver Medal at the 2004 Athens Olympic Games. Obikwelu, formerly from Nigeria, will explain to delegates how much he has relied upon sports chiropractic care to prevent injury, improve reaction time, enhance range of motion and run personal-best times.