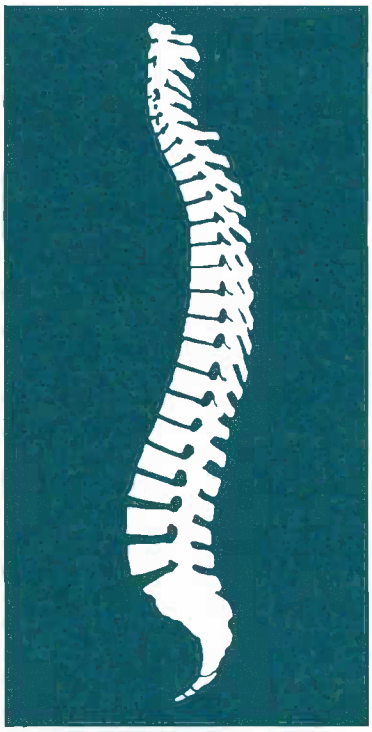
THE CHIROPRACTIC REPORT

Editor: David Chapman-Smith LL.B. (Hons.) November 1999 Vol. 13 No. 6



PROFESSIONAL NOTES

Musculoskeletal Medicine

Now that spinal manipulation has a scientific seal of approval for back pain (the second most frequent reason that patients consult a health care professional), and is fast receiving the same for neck pain and headache (the third most frequent reason), the medical profession is establishing its qualifications, societies, literature and presence in this field.

The new specialty or discipline is being named musculoskeletal medicine (MSM) and international coordination of this is through the International Federation for Manual/Musculoskeletal Medicine (FIMM - the acronym is from the French).

Much information on this emerging discipline, which will obviously present a significant challenge to chiropractors in their core areas of practice, is found in the *Journal of Orthopaedic Medicine*. The JOM is now the official publication of the organizations championing MSM in the U.K. (The British Institute of Musculoskeletal Medicine and the Society of

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INFANTILE COLIC

A. INTRODUCTION

An important new trial from the University of Southern Denmark, Odense, published in October in the *Journal of Manipulative and Physiological Therapeutics (JMPT)* provides compelling evidence that the disorder labeled 'infantile colic' has been misunderstood. The pain and other symptoms of colic seem to have a musculoskeletal rather than a gastrointestinal origin.

This new randomized, controlled trial[1] confirms and expands the findings of a large multicenter study from Denmark 10 years ago[2] in reporting that:

1. Chiropractic management of newborns with infantile colic is safe and effective.

2. Such management, involving palpation of the entire spine then adjustment of vertebral joints found to have restricted range of motion, is significantly more effective than standard medical treatment with dimethicone.

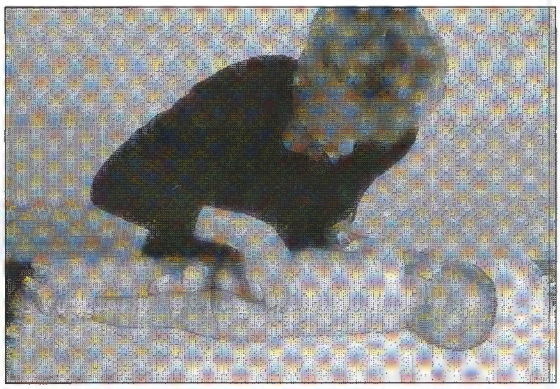
Dimethicone, explains Niels Nilsson, DC MD PhD who has chiropractic and medical qualifications and is one of the investigators in the new trial, to decrease foam building in the gastrointestinal tract. For this reason it has been presumed to reduce intestinal gases and be useful for the treatment of infants with colic. However previous studies,[3,4] and now this trial, have not been able to demonstrate that this drug therapy provides any greater effect than a placebo response. Manipulation causes somatovisceral spinal reflexes that can affect motility or movement of the contents of the GI tract. Chiropractic manipulation has now been demonstrated to be significantly better than a placebo.

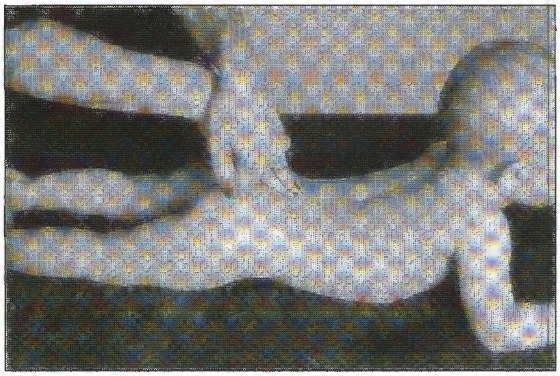
For many years researchers have tried to find a predisposing factor for infantile colic, a clear difference between normal and colicky infants. In a companion study from this Danish research team of Wiberg, Nordsteen and Nilsson, to be published shortly, a significant difference has finally been found. On average infants with colic have a 35% faster birth process than other infants – from commencement of labor to birth.[5] Nilsson says this more concentrated birth process, with faster movement into and through the birth canal, may well provide forces that are an explanation for the spinal restrictions and pain now found to be an underlying factor in infantile colic.

2. This trial is of importance to parents and infants, family physicians, pediatricians and other health professionals, and is one of those rare pieces of research that should have a major impact on clinical management of a common disorder. Following extensive coverage of the trial results in the media in Denmark, the Danish Chiropractors' Association reports a large increase in the number of infants being seen by chiropractors in practice during the past two weeks – from the public directly but also on medical referral and through recommendations to parents from health visitor nurses such as those participating in the trial.

Dr. Jesper Wiberg, the chiropractor who treated infants in the trial, normally has about 10% of his patients under the age of 15, 1% under the age of 12 months. "Yesterday 8 of 35 patients I saw were infants with colic," Wiberg reports. Since the story broke many medical doctors have referred infants, and several have brought their own babies to him, especially since the University of Southern Denmark – which has a large medical school – featured this trial's results as the main story in its magazine in October.

This Report now looks at what is known about infantile colic, the multicenter





Spinal adjustment techniques for infants.
Courtesy of Gregory Plaugher, DC and Claudia Anrig, DC.

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Changes of mailing instructions should be sent to The Chiropractic Report, 3080 Yonge Street, Suite 5065, Toronto, Ontario M4N 3N1, telephone 416-484-9601, fax 416-484-9665. Printed by Harmony Printing Limited, 123 Eastside Drive, Toronto, Ontario, Canada M8Z 5S5.
ISBN 0836-144

study performed in the 1980s, and then the new trial.

B. Infantile Colic

3. Infantile colic is common, effecting approximately 20% of newborns,[1,2] and destructive to family life – and is therefore much studied. However the cause has remained unknown, as has an agreed and effective form of medical treatment. It has not even been known whether the disorder is primarily visceral (a digestive disorder, which then produces musculoskeletal signs and symptoms) or neuromusculoskeletal (joint and muscle restrictions causing referred pain, altered spinal reflexes and digestive problems).

Infantile colic was first described in 1894 as dyspepsia, and the term refers to persistent and often violent crying for no apparent reason in otherwise healthy and thriving young infants. It is different from normal crying because distress does not stop when the infant's physiological needs are met. Although there is no complete agreement on diagnostic criteria the most accepted definition is:

"Unexplainable and uncontrollable crying in babies from 0 to 3 months old, more than 3 hours a day, more than 3 days a week for 3 weeks or more, usually in the afternoon and evening hours."[1]

Some studies focus on the higher frequency and pitch of crying, others on the physical unrest with flexing of the knees against the abdomen, clenching of the fists, and extension or straightening of the trunk and extremities. However all experts in this field agree that "apart from the increased crying, these infants are otherwise healthy, thriving, and have a normal weight gain."[1]

Colic is self-limiting. Approximately 1 in 2 cases (47%) resolve at about 3 months. Four in 10 (41%) resolve between 3 and 6 months, and 1 in 10 (12%) resolve between 6 and 12 months.[6] In the meantime, especially in moderate to severe cases which may involve uncontrollable crying for many hours by day and night every day, colic is destructive to both infant and family and often results in parental violence to infants.[7,8,9]

4. As to the cause of infantile colic, some researchers have suggested increased air in the intestines, but radiologic studies have shown no variation between normal and colicky infants.[10,11] Others have suggested, but been unable to demonstrate, restrictions in the intestines and their contents. Others again, in the words of Wiberg, Nordsteen and Nilsson, "have investigated levels of intestinal hormones, fecal analysis, intestinal microflora, markers of intestinal damage, or occult blood in the stools and hydrogen-ion concentration in the breath, but none of these studies have convincingly identified abnormalities in infants with colic."

Others have tried to link the risk of infantile colic and the method of birth, comparing cesarean section and vaginal birth,[12,13] or link colic with the use of various anesthetics (e.g. pudendal block, epidural analgesia, general anesthesia, intravenous oxytocin)[14] but no link has been demonstrated.

Because the source of the irritability and pain has been unknown, because onset follows the trauma of birth and the change to a weight-bearing environment, because they have found a high incidence of abnormal spinal joint function in colicky infants, and because correction of this has frequently brought relief, chiropractors have postulated that a significant cause of infantile colic may be spinal dysfunction or subluxation – restricted movement in spinal joints and associated tissues.

Wiberg, Nordsteen and Nilsson review the many different medical treatments that have been used for management of infantile colic:

• Dicyclomine hydrochloride was often used until the mid-1980s, when reports about serious side effects stopped this treatment.

• Gripe-water, alcohol, atropine, skopyl, phenobarbital, meperidine, homatropine and merbentyl have been used with varying results but no firm evidence of effectiveness.

• Phenobarbital, homatropine and alcohol have been subjected to double-blind study but this showed "no effect compared with a placebo treatment."

• Various other medications have been discontinued because of serious side effects.

• One drug still used is dimethicone (Simethicone, Mylicon) but "several good controlled studies" have now shown that "this is no better than placebo treatment."

5. In 1985 Nilsson, a Danish chiropractor and medical doctor who was then Academic Dean at the Anglo-European College of Chiropractic, Bournemouth, England, commenced his research in this field with a retrospective study which reported good results with chiropractic management of infantile colic in 90% of infants.[2] This study was undertaken as a starting point because of the many individual case reports of the effectiveness of manual care by chiropractors and others. It led to the multicenter study and the new trial which are now reviewed in detail.

C. The Multicenter Study[2]

6. **Methods/Design.** This was a prospective multicenter study by Klougart, Nilsson and Jacobsen in Denmark in 1985, coordinated by the Danish Chiropractors' Association and involving 73 chiropractors in 50 clinics. During the three month period of April to June 1985, 569 infants presented as patients in these clinics. The study group of 316 was comprised of all infants who fulfilled the following inclusion criteria:

a) Parental consent.

b) Age between 2 and 52 weeks. (Median age at beginning of treatment was in fact 5.7 weeks).

c) No symptoms suggestive of any other disease apart from the colic.

d) At least one violent crying spell lasting a minimum 1.5 hours during 5 of the 7 preceding days, and normal behavior outside colicky periods.

e) No previous illness apart from colic.

f) Weight gain of at least 150 grams per week.

g) Behavior during colic including motoric unrest, frequent flexing of the knees towards the abdomen and/or backward bending of the head and trunk.

h) Upon chiropractic examination the presence of spinal functional disturbance.

i) During colic an inability to be comforted by various normal means, including cradling, change of diaper, offer of food or dummy or other comfort.

7. **Outcome Measures.** Results or outcomes were measured as follows:

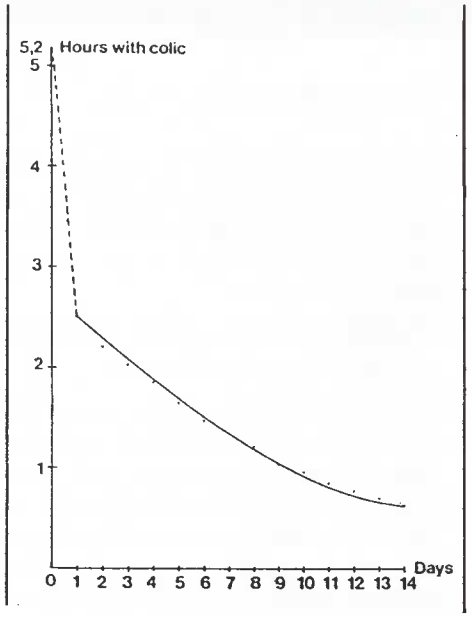
a) A standard diary kept by mothers for 28 days and recording feeding, awake and sleep periods, and symptoms (stools, colic periods, etc). Previous research had established these diaries as reliable, objective and valid.

b) Structured interviews with mothers by chiropractors 1, 2 and 4 weeks after commencement of treatment, yielding overall subjective evaluation by mothers of the intensity of colicky crying. This enlarged upon the objective data in the diaries.

8. **Intervention.** Ranges of motion of all of the joints of the spine were tested by palpation at the initial visit and each subsequent consultation over the two week treatment period, and joint dysfunction or subluxation was recorded and treated by adjustment/manipulation.

Treatment was limited to spinal manual therapy but the actual technique was left to the discretion of each individual chiropractor. As the investigators report, chiropractic treatment of infants follows the same principles as for adults, but with important modifications. Force is greatly decreased, the contact is usually one or two fingers alone, and the adjustive thrust – if performed at all – is very modest. The manipulative 'crack' from the release of gas within the joint which usually marks joint manipulation in adults is very rarely heard. Treatment, illustrated in the photographs, is no more trouble to the infant than basic physical examination.

Figure 1



Average daily length of colic from Days 1–14 based on 256 complete diary recordings for the period. Day 1 = 2.5 hours, Day 14 = 0.65 hours. The average time with colic on Day 14 represents a 75% reduction in colic crying time compared to Day 1.

9. **Results.** The findings of the study were:

a) Infants in the study had a median age of 2 weeks at commencement of colic, a median age of 5.7 weeks at beginning of treatment.

b) Prior to treatment the average daily length of time with colic was 5.2 hours, the average number of episodes per day 2.5. (In other words these infants had moderate to severe colic).

There was a "dramatic reduction" in hours with colic occurring on the first day of treatment – reduced by more than half to 2.5 hours. There was then a pattern of continuous reduction to an average of 0.65 hours per day on Day 14. (See Figure 1.) Average colic episodes per day were 2.5 at outset, 1.3 after one week, and 0.9 after two weeks.

c) At 2 weeks, following an average number of 3 treatments, there was a success rate of 94% (colic stopped 60%, improved 34%). Of the balance of 6%, there was no significant change in 4%, and 2% were worse. On assessment at 4 weeks improvement was maintained. Importantly, no adverse side effects were reported.

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Orthopaedic Medicine, the U.S. (The American Association of Orthopedic Medicine) and the Netherlands (The Dutch Federation for Manual Medicine). It has an international editorial board and principal editor is Dr. Richard Ellis, a rheumatologist from Salisbury, England.

Chiropractors may be surprised to learn that MSM is facing very similar issues to the chiropractic profession. For example:

1. There is tension between groups of MDs who promote broad and narrow scopes of MSM. In the Netherlands the Dutch Federation of Manual Medicine represents two organizations - the Dutch Society for Manual Medicine with 250 members which adopts the public profile that MSM is for musculoskeletal disorders, and the Dutch Society for Orthomanual Medicine with 65 members which openly acknowledges and promotes that MSM also influences the function of different visceral systems.

And in the former group there is another division - some members practise MSM full-time and are therefore eligible to be placed on a register of MSM specialists, others use MSM part-time only and are not.

2. MSM, explains FIMM President Dr. Michael Hutson in a recent JOM editorial, "promotes holism and empiricism but for this reason lacks credibility with many in the medical profession . . . . The crux of the problem for MSM is how to identify itself with those twin pillars of medical modernism, evidence-based medicine and the randomized controlled trial, and cement its credibility."

"Under my presidency FIMM will be devoted to strengthening the scientific basis of MSM, to harmonise the training of musculoskeletal physicians globally and to pursue the objective of a higher profile and status for our discipline."

FIMM Past-President Dr. Alfred Mohrle echoes these sentiments in saying "it is essential for the survival of MSM that it is seen as a branch of medicine that is based on scientific fact and can therefore be taught at university level. This cannot be achieved without precise definition of its theories and techniques and a language that can be understood by all doctors."

Another feature of the emerging discipline of MSM is that it admits osteopaths into membership in many countries and draws on osteopathic theory and techniques, but chiropractors have generally not been admitted and are seen as competitors.

What must be the response of the chiropractic profession? As it is has been doing for the past 25 years it must simply raise the bar and work even harder to retain its leadership in education, research and practice. With respect to these:

• **Education**. Presently MSM is taught in relatively unstructured part-time postgraduate courses. MD students clearly have inconsistent and inadequate theoretical and clinical training at present. This is acknowledged, and their goal is formal full-time university-based specialty education. Logically the chiropractic profession has an answer to this. It is expensive and irrational to have medical students complete a full training and then specialize in MSM when there are already specialized health care providers in this field of practice – chiropractors. To develop MSM as a university-based specialty would be similar to developing dentistry as a medical specialty.

• **Research**. Chiropractors, as they have done, must continue to lead in research. It is important that most books and chapters written on spinal manipulation and most basic science and clinical research be generated by the profession. This issue of the Report discusses the first multicentre study and randomized controlled trial of manipulation for infantile colic – they have been by chiropractors supported by their professional organizations. Chiropractic researchers are prominent in the trials on back pain, neck pain and headache. Imagine if leadership in all these research areas was in the hands of osteopathy or physical therapy or MSM.

• **Practice.** The majority of the public identifies spinal manipulation with the chiropractic profession. That automatic identification is important but is going to be harder to maintain in the future. Much could be said here. The single most important thing, consistently identified by all focus groups, experts and outside consultants to the profession, is that the chiropractic profession must clearly and consistently establish a market image in language that the public and the medical profession can understand and trust. MSM understands the importance of this – so must the chiropractic profession.

North America

1. **U.S. – ACA vs DHHS Producing Results**. In its lawsuit against the Department of Health and Human Services filed last November, the American Chiropractic Association is seeking to expose restricted access to chiropractic services by HMOs providing Medicare services for seniors, and illegal provision of chiropractic services by medical doctors, physical therapists and others. This is of particular significance to US chiropractors because private plans, notably Blue Cross/Blue Shield, tend to follow the practices of the DHHS. It is of significance to chiropractors in various other countries because US health benefits insurers write business and influence insurance patterns in many other countries. Recent important developments are:

• In April the DHHS finally filed a long overdue report to the US Congress on access to chiropractic services under Medicare in HMOs. This report acknowledged a 1991 study showing that the chiropractic service of 'manual manipulation of the spine to remove a subluxation' was given by osteopaths in 100% of HMOs, by MD orthopedists in 57%, and by physical therapists in 29%. 78% of HMOs also utilized chiropractors to some degree – exact figures are being pursued.

• Secondly, in a preliminary motion filed on September 2, 1999, the DHHS has acknowledged that it is illegal for physical therapists to be providing the chiropractic service. This is a major admission which will have immediate practical impact. The DHHS

is still arguing, however, that the chiropractic service can be provided by "suitably qualified" medical doctors and osteopaths.

This lawsuit is now widely seen as being as important as the *Wilk* vs. *American Medical Association* lawsuit won by the profession in 1987. Recent supporters include the Association of Chiropractic Colleges (US$50,000) and the National Board of Chiropractic Examiners (US$50,000). Prior support has been given by most chiropractic colleges, most state chiropractic associations, the Congress of Chiropractic State Associations, 25 major vendors to the chiropractic profession and the National Association of Chiropractic Attorneys.

2. **U.S. – Northwestern Health Sciences University**. We hear that many medical schools, listening to patients, surveys and documented trends in the health care market, are adapting to incorporate alternative medicine. Minnesota's Northwestern College of Chiropractic (NWCC) has made a similar adaptation and is now part of the Northwestern Health Sciences University (NWHSU). NWHSU is based at the NWCC campus in Bloomington, but is a merger of three institutions and now comprises programs in chiropractic (its flagship program, still under the identity of NWCC), acupuncture, oriental medicine and herbal studies (through the Minnesota Institute of Acupuncture and Herbal Studies, formerly of St. Paul and the only accredited institution in the state offering diplomates in these fields - there is a four year master's level program), massage therapy (through the Sister Rosalind Gefre School which is similar in size to NWCC and has branch campuses in Minnesota, North Dakota and Wisconsin), and integrated health and wellness (a master of science course designed for chiropractic graduates and focusing on nutrition, exercise and physical fitness).

EUROPE

1. **Research**. *Chiropractic Effective for Patients with Chronic Whiplash and Objective Signs*. A new study from the Department of Orthopaedic Surgery, University of Bristol, England, concludes that for patients with objective signs "chiropractic is the only proven effective treatment in chronic cases (of whiplash injury)". Physicians referred 93 consecutive chronic pain patients (average disability period – 12.7 months) for chiropractic management. On the basis of symptoms patients were classified into one of three groups:

a) Group 1 (number 50) – a coat-hanger distribution of pain, restricted range of neck movement, but no neurological deficit.

b) Group 2 (n 32) – as above but also with neurological signs and/or symptoms.

c) Group 3 (n 11) – severe neck pain, but full range of neck movement and no neurological symptoms or signs. Commonly these patients presented an unusual complex of symptoms. All but one were female.

On an average number of 19.3 treatments with spinal adjustment/manipulation over an average period of 4.1 months, there was significant improvement in Group 1 and 2 patients, but not those in Group 3 – i.e. the patients with no objective signs. This confirmed an earlier study by members of this research team. On one hand this was only a retrospective review rather than a prospective study or trial, on the other hand it was independent with the principal investigator being a university-based orthopaedic surgeon. (Khan S, Cook J et al. *A Symptomatic Classification of Whiplash Injury and the Implications for Treatment*, J Orthopaedic Med, 1999:22(1):22-25.)

Lumbar Traction and Interferential Therapy – No Proven Value for LBP. In Germany there is a large group of non-medical 'orthopaedic practitioners' who offer non-surgical primary care for patients with back pain. In 1995 there were 4,548 of these practitioners and basic methods used by them are traction and interferential therapy. A controlled trial by medical investigators in Germany and the U.K. published in *Spine* assesses both these methods and finds them of no value. There is already substantial evidence that traction by itself is of no value for patients with LBP but this is the first randomized controlled trial of interferential therapy. (Werners R, Pynsent PB et al. *Randomized Trial Comparing Interferential Therapy with Motorized Lumbar Traction and Massage in the Management of Low-back Pain in a Primary Care Setting*, Spine, 1999:24(15):1579–1584.)

Acupuncture – Also Unproven for LBP. Maurits van Tulder, PhD from Vrije University, Amsterdam was the lead researcher in the important recent systematic review which concluded that manipulation was effective in the management of patients with chronic low-back pain. (Van Tulder MW, Koes BW, Bouter LM *Conservative Treatment of Acute and Chronic Nonspecific Low-back Pain: A Systematic Review of Randomized Controlled Trials of the Most Common Interventions*, Spine 1997: 22(18):2128–2156). Here, with prominent LBP reviewers Daniel Cherkin, PhD (U.S.) and Bart Koes, PhD (The Netherlands), plus Brian Berman MD and Lixing Lao PhD LAc from the Division of Complementary Medicine, Department of Family Medicine, University of Maryland, Baltimore, van Tulder concludes that there is not yet sufficient evidence to support the effectiveness of acupuncture in the management of back pain and that "the authors would not recommend acupuncture as a regular treatment for patients with low-back pain." (van Tulder MW, Cherkin DC et al, *The Effectiveness of Acupuncture in the Management of Acute and Chronic Low-back Pain*, Spine 1999:24(11):1113–1123).

2. **Portugal**. In response to recent efforts of the Portuguese Order of Medicine to enact legislation which would restrict many non-medical health care providers from practising chiropractors in Portugal have now formally established the Portuguese Chiropractic Association (PCA). Eleven of the fourteen members of the PCA met recently with the leadership of the European Chiropractors' Union (ECU) to discuss strategy and to learn from the ECU experience in this area. The new association can be contacted through Antonio F. Alves, DC, Executive Director, Portuguese Chiropractic Association, Rua da Torre, nº1 – 1ºC, 6300 Guarda, Portugal, e-mail: dr.alves@quiropractica.com.

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Comment. Comments on these results are:

a) A relatively brief treatment time span of 14 days was chosen so that the influence of spontaneous resolution of colic symptoms could properly be disregarded. (The average age of the infants at the 2 week assessment point in the study was only 7.7 weeks). However, although the median age at beginning of treatment was 5.7 weeks, some infants were aged between 3 months and 12 months. As this is a time at which the majority of cases have resolved naturally this means there may have been some positive bias in the overall results. (For this reason, in the follow-up trial just published and discussed below infants had to be aged 10 weeks or less).

b) The study's main limitation was that it did not compare two groups of infants. Those receiving chiropractic treatment were not matched against others receiving a placebo or other treatment, and this raises the possibility that the infants would have improved even without chiropractic treatment. For this reason the researchers reported that they were now proceeding to design a full randomized controlled trial. They did so – that is the trial just published and now discussed.

D. The New Trial[1]

10. **Methods/Design.** This was a randomized controlled trial comparing standard chiropractic and medical treatments in a group of 50 infants with colic recruited as follows:

a) In Denmark the National Health Service provides mothers of newborns with health visitor nurses for counseling and advice. Infants were recruited for this study by these nurses in a suburb of Copenhagen.

b) Inclusion criteria were the same as for the multicenter study (see paragraph 5) except that:

i) The age of the infants was younger – 2–10 weeks (instead of 2–52 weeks).

ii) Violent spells of crying were more prolonged – a minimum of 3 hours long (instead of 1.5 hours), with one or more spells in at least 5 of the 7 previous days.

iii) The nurses gave a structured diagnostic interview and the first 50 infants to meet the entry criteria were admitted to the trial. Parents were then asked to complete a 24 hour infantile colic diary daily for one week of observation without treatment, recording:

- Periods when infants were awake, sleeping, or crying.
- Bowel movements
- Feeding patterns.

As already noted, previous research had established these diaries as reliable, objective and valid. After the week of baseline observation the nurses randomly allocated infants to one of the two treatment groups - one receiving chiropractic manipulation and the other dimethicone.

11. In both treatment groups parents received the counseling normally given by health visitor nurses – "advice on breast-feeding technique, mother's diet, air swallowing, feeding by bottle, burp technique, observation of the infant's belly, stools and passing water, vomiting, eating and sleeping rhythm . . .". In addition:

a) Infants in the medical treatment group (number 25) were given dimethicone daily for two weeks in accordance with Danish guidelines for medical practice.

b) Infants in the chiropractic treatment group (n 25) were referred to a local chiropractor for physical examination and spinal manipulation where indicated for a two week period. Examination included motion palpation of the joints of the spine and pelvis to assess movement restrictions. Treatment comprised manipulation/mobilization "with specific light pressure with the fingertips . . . (3-5 treatment sessions) until normal mobility was found in the involved segments."

12. Throughout the two weeks of treatment the parents continued to complete the daily diaries. At the end of the first and second weeks the nurses visited to complete an infantile colic behavior profile, registering the parents' subjective evaluation of change.

At the end of the treatment period all diaries and colic behavior profiles were interpreted by an observer who was unaware of the treatment received or, to use the technical term, blinded. The main measurement of results (outcome measure) was the percent change for each child in the average number of hours of infantile colic behavior per day as registered in the diaries.

13. **Results**.

c) The pre-treatment characteristics of the infants in each group (e.g. number of weeks with colic, hours of colic per day, days without colic in the last week, birth weight, weight gain, duration of birth, etc.) were similar, meaning that the groups were well matched. These characteristics are discussed in detail in the published research.

d) The average reduction in daily hours of infantile colic was greater throughout for infants in the chiropractic manipulation group, significantly so from Days 4–7 onwards. Specifically:

i) Results were averaged into blocks of four days "to minimize the effect of random day-to-day variation," and are seen in Figure 2.

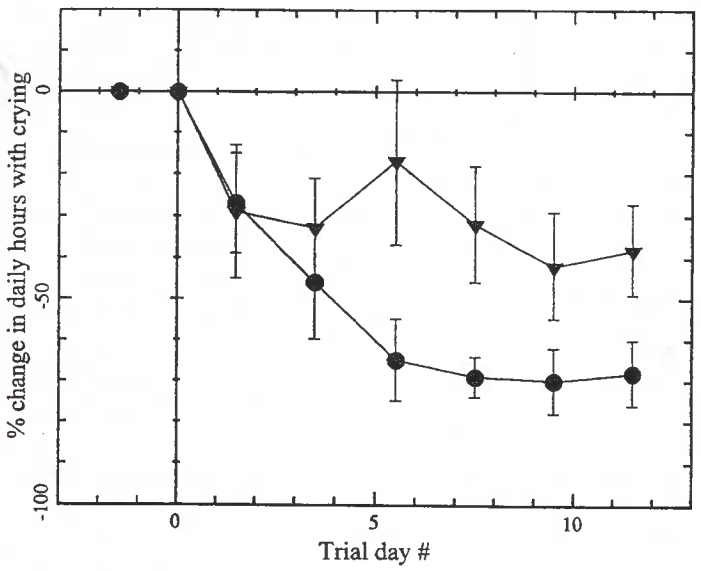
ii) In the dimethicone group, in Days 0-3 there was a one hour reduction in colic behavior from an average of 3.4 hours to an average of 2.4 hours daily. There was no further reduction thereafter.

iii) In the chiropractic manipulation group, in Days 0-3 there was a 1.6 hour reduction from 3.9 hours to 2.3 hours on average. In Days 4-7 there was a 2.4 hours reduction, and in Days 8-11 a 2.7 hours reduction. This means that a little after one week under treatment infants in the manipulation group had 50% less colic behavior than those in the dimethicone group (an average of 1.2 hours daily vs 2.4), having been marginally worse before treatment started (3.9 hours vs 3.4 hours).

As shown in Figure 2, the dimethicone group in the trial had a reduction of 38% by Day 12, the manipulation group a reduction of 67%.

c) There were 9 drop-outs in the dimethicone group and none in the chiropractic group. If the reason for this could be parental bias against dimethicone treatment this would represent a problem. However in all of the cases where information is available (7 of the 9 drop-outs) this was because of a documented worsening of symptoms during treatment. Eight dropped out by Day 7. For scientific reasons data for these drop-outs was excluded in the analysis of results but, as the researchers point out, this means

Figure 2



Graph showing the percentile reduction in daily hours with infantile colic before and after the start of treatment on Day 0. Circles represent the manipulation group, triangles the dimethicone group. The error bars (1 SE) show that from Day 5 onward the two groups differ significantly. Reduction at Day 12 was 67% in the manipulation group, 38% in the dimethicone group.

that a number of more severe cases are excluded from the dimethicone group. This introduces "a serious bias against showing an effect" in the chiropractic manipulation group, and therefore makes the significant improvement under manipulation even more impressive.

d) The average number of treatment sessions in the chiropractic manipulation group was 3.8, and movement restriction or subluxation treated was "primarily in the upper and mid-thoracic area." This represents an interesting difference from the multicenter study – in which restricted motion was frequently in the thoracic spine but was most commonly found in the cervical spine.

e) For the chiropractic manipulation group the results were virtually identical to the earlier multicenter study – in that study there was a 66% reduction in average daily hours with colic by Day 12, in the new trial an average reduction of 67%.

Wiberg, Nordsteen and Nilsson note that the similar results in the two studies "strengthen the conclusion that a positive effect of spinal manipulation exists in the treatment of infantile colic." They would have preferred a longer follow-up period but in these busy families with colicky infants there was too much missing data after 12 days – those families who had not been helped did not wish to persist, and those who had wanted to return to normal family life.

14. How can a spinal problem cause symptoms of colic such as a tense or distended abdomen, rumbling abdominal noises, and passing excess air, and how can these symptoms be relieved by spinal manipulation? In fact there is now a developed theoretical and experimental basis for the answer to these questions.

This is discussed in some detail by neurophysiologist Akio Sato, MD PhD in his chapter titled *Spinal Reflex Physiology* in Haldeman's *Principles and Practice of Chiropractic*.[15] In summary, somato-gastrointestinal reflexes are well known clinically. Mechanical stimulation of the somatic tissues – for example pinching of the skin, a spinal functional restriction in the joints and/or muscles or manipulation of a joint to remove that restriction – causes reflexes that may influence the motility of the contents of the gastrointestinal tract. This influence of spinal reflexes on GI motility has been reported for dogs, cats, monkeys and humans.

15. Currently chiropractic science offers these explanations or hypotheses as to how manipulation may help or relieve the symptoms of newborns thought to have infantile colic:

a) Referred pain from spinal joint dysfunction simulates and is mistaken for abdominal pain. (Some infants in the Danish studies did *not* have significant GI symptoms accompanying their colicky crying). Correction of the purely musculoskeletal problem brings relief.

b) Probably in most cases, given the results of the Danish trial, a gastrointestinal disorder is initiated by pain and other results of joint dysfunction. Restriction and reduced mobility in a spinal joint, and/or paraspinal muscle spasm, produce reflex responses in the nervous system that cause sustained, altered neurophysiological effects in nerve pathways to the gastrointestinal system giving rise to pain and the GI symptoms commonly reported with colic.

c) A relatively mild digestive disorder produces a reflex response in the nervous system that causes spasm of the paraspinal muscles and spinal joint dysfunction. Spinal reflexes and pain from this dysfunction aggravates the gastrointestinal disorder causing to a level of discomfort that produces persistent colicky crying. Correction of the spinal problem (secondary to the digestive disorder, but the primary source of symptoms) brings relief.

D. Conclusion

16. The Danish trial is convincing because of its scientific rigor and because it confirms previous findings. However its findings needs to be duplicated in further studies, and clinicians must be aware of these limitations:

a) There were explicit inclusion criteria for infants – these results only apply to infants who meet these criteria, and in particular colicky infants who are otherwise healthy, thriving and have a normal weight gain.

b) This trial does not involve preventive care and is confined to an average of 3–4 treatments over two weeks. Slightly more extended treatment may produce more complete relief in some infants – where there is still unresolved spinal fixation - but this trial is not evidence for that or for a more prolonged course of treatments.

16. Finally, critics of the profession, especially medical critics, often hold up infantile colic as a graphic example of a condition treated by chiropractors that is obviously outside their scope of practice. Some have argued that chiropractic management of infants should be illegal or only on the basis of medical referral. However this trial makes infantile colic the best current example of what might be called the fundamental principle of chiropractic

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care. This is that the main focus of chiropractic practice is not specific conditions but the functional integrity of the neuro-musculoskeletal system. From the layperson's perspective chiropractors may be said to be treating specific symptoms or disorders, in this instance infantile colic, but from a chiropractic perspective they are primarily treating spinal dysfunctions or lesions – traditionally termed subluxation. These may be a significant factor in many disorders apparently remote from the spine because of changed biomechanics, referred pain and other altered neurophysiology. For infantile colic, the logic and success of the chiropractic approach has now been demonstrated.

TCR

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Elsewhere

1. **Guatemala**. Dr. David Tyggum (National College, 1996), a Guatemalan by marriage, has practised for the past year in affiliation with a major hospital in Guatemala City and, like Dr. Marco Torres-Fry who has practised in the city for over 20 years, has earned a respected place in the health care community. There has previously been no formal recognition of chiropractic in Guatemala, but Dr. Tyggum has now obtained a Ministry licence for his chiropractic office and is in the process of official recognition of his academic degrees. *Contact:* Dr. David Tyggum, Tel. (502)363-5409, e-mail: drtyggum@guate.net.

2. **Morocco**. As official chiropractor for the powerful Moroccan track and field team Dr. Jelloul Belhouri of Casablanca (Cleveland, 1991), treats several of the world's elite track stars including world mile record holder Hicham El-Geurrouj (4:43.13 seconds). Dr. Belhouri was with El-Geurrouj at the World Track and Field Championships in Seville, Spain this past summer when he retained his world championship at 1500 meters, and Dr. Belhouri's work in sports chiropractic has given national prominence to the profession in his country. *Contact:* Dr. J. Belhouri, 93 rue D'Agadir Angle (Agadir-Bd Zerktouni), Casablanca, Morocco; tel: (212)2-297-341; fax: (212)2-132-950.

Dr. Jelloul Belhouri with world 1500 meters and one mile record holder Hicham El-Geurrouj at a recent Royal reception in Morocco.