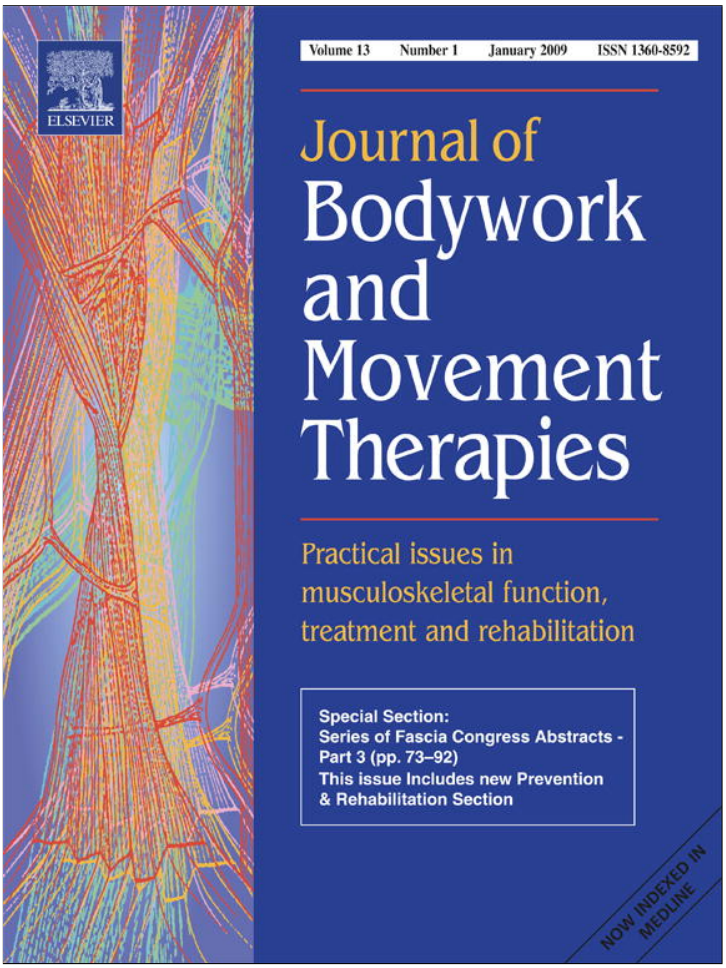

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INTEGRATIVE MEDICINE

Gua sha research and the language of integrative medicine

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Summary This article is based on research findings published by Nielsen et al. [2007a. The effect of '*Gua sha*' treatment on the microcirculation of surface tissue: a pilot study in healthy subjects. EXPLORE: The Journal of Science and Healing 3, 456–466]. The abstract was accepted for poster session at the conference on fascia (www.fascia2007.com) and appears in the conference text *Fascia Research* [Nielsen, A., Knoblauch, N., Dobos, G., Michalsen, A., Kaptchuk, T., 2007b. The effect of '*Gua sha*' treatment on the microcirculation of surface tissue: a pilot study in healthy subjects. In: Findley, T.W., Schleip, R. (Eds.), Fascia Research: Basic Science and Implications for Conventional and Complementary Health Care. Elsevier, Munich, Germany, pp. 249–250]. Our *Gua sha* perfusion study, the abstract of which is reprinted in Box 1, was the first investigation into the physiology of *Gua sha*, a technique of traditional East Asian medicine used to treat conditions that have features of blood stasis, pain, and/or inflammation. Issues raised by our study are discussed here such as the significance of the terms used in Western medical literature to describe traditional indigenous therapies like *Gua sha* and the implication of our findings not only for future research but toward a shift in how the integrative medical community signifies its work.

What is *Gua sha*?

Gua sha is a traditional healing technique widely used in Asia, in Asian immigrant communities, and by acupuncturists and practitioners of traditional East Asian medicine worldwide. *Gua sha* is and has been informed by the experience of its use. It is generally regarded as effective for acute or chronic

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Box 1 Original Research Abstract (reprinted with permission)

The effect of *Gua sha* treatment on the microcirculation of surface tissue: a pilot study in healthy subjects. (A. Nielsen, N.M. Knoblauch, G. Dobos, A. Michalsen, T.J. Kaptchuk, 2007a).

Context: *Gua sha*, therapeutic surface frictioning that intentionally raises transitory petechiae and ecchymosis, is a traditional East Asian healing technique also known as *cao gio*, coining, scraping, and spooning. There are case reports in Western literature but no studies on the physiological effects of *Gua sha*.

Objective: To study the microcirculatory effects of *Gua sha* on the skin and subcutis in humans to elucidate physiological mechanisms responsible for the clinically observed pain-relieving effect of this treatment.

Design: Laser Doppler imaging (LDI) was used to make sequential measurements of the microcirculation of surface tissue before and after *Gua sha* treatment in 11 healthy subjects. The effect of *Gua sha* treatment on the microcirculation of surface tissue was expressed as changes from baseline in arbitrary perfusion units (PU).

Setting: The study was conducted at the Department of Nephrology, Unit of Circulation Research, University Hospital of Essen, Germany.

Subjects: Subjects were volunteers from the nursing and physician staff of the Kliniken Essen.

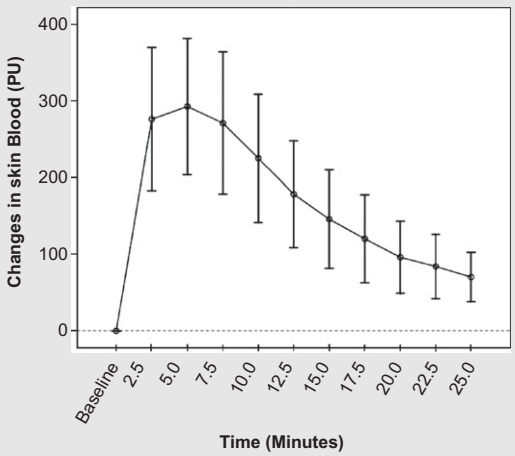
Intervention: A single *Gua sha* treatment was applied to an area of each subject's back.

Outcome measures: Change in microcirculation was measured in PUs. Change in myalgia was subjectively reported and confirmed by manual palpation.

Results: *Gua sha* caused a fourfold increase in microcirculation PUs at the treated area for the first 7.5 min following treatment and a significant increase in surface microcirculation during the entire 25 min of the study period following treatment ($P < .001$). Females showed significantly higher rates of response than males ($P = .003$). Each subject experienced immediate decrease in myalgia in both the site treated, in the related distal control site, and in some cases, other distal sites. Pain relief persisted to some extent up to the follow-up visit. There were no adverse reactions.

Conclusion: *Gua sha* increases microcirculation local to a treated area, and that increase in circulation may play a role in local and distal decrease in myalgia. Decrease in myalgia at sites distal to a treated area is not due to distal increase in microcirculation. There is an unidentified pain-relieving biomechanism associated with *Gua sha*.

Keywords: *Gua sha*, *cao gio*, coining, scraping, spooning, acupuncture, traditional East Asian medicine, indigenous medicine, domestic sector healthcare, surface microcirculation, pain relief (Explore 2007;3:456–466)



Following *Gua sha* treatment, scans were taken every 2.5 min for 25 min, for a total of 10 scans. *Gua sha* caused a significant increase in surface microcirculation ($P < .001$) during the entire 25 min relative to baseline after treatment, with a fourfold increase in PUs specific to the treated area for the first 7.5 min following treatment (95% confidence limits shown).

pain and for mild to severe conditions such as colds, flu, fever, heatstroke, and respiratory problems such as asthma, bronchitis, and emphysema; functional internal organ problems as well as musculoskeletal problems (from fibromyalgia to severe strain, spasm or injury), and is indicated in any cases of recurring fixed pain. It is used as a form of self or familial care in the home (Craig, 2002; Fadiman, 1997; Hautman, 1987; Van Nguyen and Pivar, 2004) as well as in clinical practice (Nielsen, 1995; Zhang and Hao, 2000). For pain and inflammation associated with blood stasis, *Gua sha* is superior to acupuncture treatment.

Gua means to scrape or scratch in Chinese (So, 1987). Although scraping implies abrasion or injury to the surface, with *Gua sha* the skin remains intact; there is no abrasion. *Gua sha* consists of repeated, unidirectional, pressured stroking with a smooth edge over a lubricated area until sha blemishes appear (see Figures 1 and 2). For detailed description of *Gua sha* see Box 2 (Figure 3).

While Sha is literally translated as sand, sharkskin, or red, raised, millet-size rash (Ou Ming, 1988), it is important to understand that sha is a polysemous term. It describes the presence of blood stasis in an asymptomatic dormant form. Sha also describes the petechiae that are raised from *Gua sha* (see Figures 1, 2c and 4). Healthy subjects may have sha in an asymptomatic, pre-symptomatic or mildly symptomatic state that is potentially pathogenic. Or persons who are ill may have sha, the effects of which have progressed to a level of manifest pathogenicity.

Sha is most closely described as petechiae though much of the time the extravasated blood appears as red macula (Figures 1, 2c and 4). The blemishes begin to fade to ecchymosis immediately blending into an ecchymotic patch. Figure 5 shows 2-day old sha ecchymosis.

Figure 1 Application of *Gua sha*: *Gua sha* is applied with a smooth curved edge instrument over a lubricated area. Photo by Arya Nielsen.

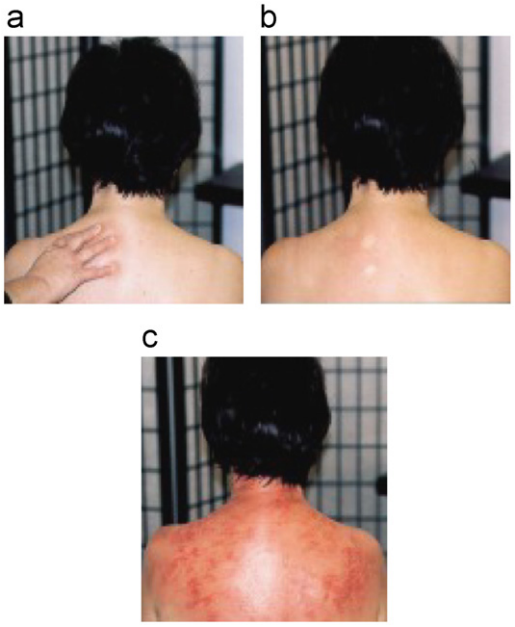


Figure 2 One indication of sha stasis is blanching that is slow to fade from pressing palpation. Pressing palpation (a) resulting in blanching (b) that is slow to fade signifies sha stasis, an indication for *Gua sha*. The same patient after *Gua sha* (c). Photo by Arya Nielsen.

Sha is also translated as cholera (Mathews, 1931; Weiger, 1965) wherein sha blemishes resemble cholera's end-stage rash. *Gua sha* in the East, like frictioning in early Western medicine (Jackson, 1806), was used in the treatment of cholera and cholera-like disorders (So, 1987).

In Vietnamese *Gua sha* is called *cao gio* (pronounced 'cow yo', meaning to 'scratch out the wind' (Mudd and Findlay, 2004; Craig, 2002); in Indonesian kerik (ka-drik or ka-drok) (Zuijlmans and Winterberg, 1996) or kerokan (Wilson, 1994); in Khmer Cambodian kos khyal (Kemp, 1985; Frye and D'Avanzo, 1994) or ga-sal (Nielsen, 2005); and in Laotian khoud lam (cooed-lum) (Nielsen, 2003). Common translations include coining, scraping, and spooning.

Literature review: terms and complications

Published peer reviewed articles constitute professional discourse; inclusion and exclusion of information term and frame a subject for content and reference. Using a narrow scientific gaze, articles in the Western medical literature (1975–2007) identify *Gua sha*, *cao gio*, coining as a baffling, superfluous, and even dangerous attempt by Asians to care for their cultural rather than physical

Box 2 How is *Gua sha* performed?

Gua sha treatment at the back begins at the center-line with press stroking using the smooth rounded edge that is pressed into the flesh enough to contact the fascial layer (Figure 3), but not so hard that it causes pain or discomfort.

A stroke line is typically 4–6 in long.

Stroking is repeated in one direction until the sha is raised on that stroke line, typically 8–12 strokes. Some articles incorrectly describe application of *cao gio* involving rubbing back and forth with a coin (Lederman and Keystone, 2002; Walterspiel et al., 1987). This represents a misapplication of technique that could result in abrasion and not the therapeutic petechiae sought.

Sha petechiae fill the stroke line area as stroking proceeds. Stroking stops when all the sha is expressed as petechiae or macula at the stroke line, before producing ecchymosis, which will occur naturally as petechiae begin to fade and blend.

Gua sha stroking is then continued at the next stroke line directly adjacent to the one before. This goes on until the area to be treated is covered, taking approximately 5–7 min in our study.

Figure 3 A smooth-edged instrument is press-stroked right to left in this photo with the heel of the provider's hand pressing the tool into fascial layer.

Figure 4 Sha appears as a 'hickey' i.e. petechiae and ecchymosis associated with extravasation of blood from surface capillaries.

Figure 5 Two days after treatment: Fading ecchymosis seen in the same patient as in Figure 4. Sha typically fades completely in 3 or 4 days.

health (Nielsen, 2007). Terms such as 'dermabrasion', 'pseudo-battery', 'child abuse', and 'factitial dermatitis' (Silfen and Wyre, 1981), among others, have been misapplied to this therapy, and will be taken up in more detail below.

Complications have also been reported in the Western literature for *cao gio* coining such as minor burns, renal contusion and hematuria, a brain bleed, camphor intoxication and toxicity, and misdiagnosis as hematoma, factitial dermatitis, strangulation, torture, and child abuse. A careful look at each case report of complication reveals startling errors and misconceptions that have gone unchallenged until now.

A case of minor burns reportedly caused by *Gua sha* was in fact related to fire cupping (Amshel and Caruso, 2000). And yet burns continue to be erroneously cited as a risk of *Gua sha* (D'Allessandro and D'Allesandro, 2005; Rampini et al., 2002; Sullivan and Trahan, 2007). Renal contusion and micro-hematuria was reported in an infant treated with *cao gio* without ruling out the hematuria as a likely side effect of the febrile illness for which the child was being treated (Longmire and Broom, 1987).

The most egregious misreport concerns an unconscious patient who was brought to an emergency department where doctors interpreted her brain bleed to have been caused by 'painful' *cao gio*, though it is not clear how she was able to communicate that the *cao gio* was so painful given she was unconscious (Ponder and Lehman, 1994). Rather, the physicians who treated her were so alarmed by the sha ecchymosis that they listed *cao gio* as causative and not coincidental to her existing brain bleed (Nielsen, 2007).

Reports of camphor intoxication or toxicity related to *Gua sha* stemmed from use of camphor

liniments (with or without *Gua sha* treatment) whose concentration of camphor exceeded those now allowed by law in the West (Aliye et al., 2000; Rampini et al., 2002; Seigel and Wason, 1986).

The most significant and consistent complication related to *Gua sha* is its misdiagnosis by providers who are naïve to its operation. Most of the medical terminology used to describe this healing technique is inaccurate, misleading, biased, and alarming. Table 1 lists some of the terms used to describe *Gua sha* with definition and comment on their application along with citations.

Suffice it to say that *Gua sha* is not a form of battery, trauma, injury, abuse, or even pseudo-battery or pseudo-abuse. And *Gua sha* is not suitably described by terms such as dermabrasion, bruising, burns, factitial dermatitis, pseudo-factitial dermatitis, pseudo-bleeding, nummular erythema, purpura, cutaneous stigmata, or hematoma. Yet these terms have been accepted by peer review, published and continue to be cited, thus affirming *Gua sha* in a negative register of abuse/not abuse, battery/pseudo-battery, dermatological disease/not disease.

The negative register that has contextualized *Gua sha* with alarm can itself be corrected by simply calling sha by its true name: therapeutic extravasation of blood resulting in transient petechiae, macula, and ecchymosis. Or simply: sha represents 'transient therapeutic petechiae'.

A 2005 search of the Chinese medical literature database from 1984 to 2004 finds no reports of mistaken abuse or complications. Rather, there are 120 articles on outcome studies using *Gua sha* for painful musculoskeletal conditions as well as acute infectious illness, respiratory conditions, autoimmune, and inflammatory disorders (Nielsen, 2007). A full list and analyses of the studies from the Chinese medicine database can be found in the latter reference.

Significance of laser Doppler research on *Gua sha*

There are two secondary findings worth noting from our study. First, we found that nascent surface perfusion was greater at the upper back in each subject. This has not been previously reported and qualifies for further study. Second, we found a larger perfusion change in women than in men. This may be due to our small sample of 11 subjects but is worthy of further study.

As indicated in the abstract in Box 1, our study found 400% increase in surface microcirculation as a direct result of *Gua sha* for a full 7.5 min after treatment, as well as a statistically significant increase for the full 25 min studied. The findings are significant in that they demonstrate what is visible to the eye with *Gua sha*, that the red petechiae/macula/ecchymosis represents a substantial physiologic change. It is important to note that a 400% change is not reported in any other study using surface laser Doppler scanning, that is, there is no other condition or technique studied that result in a 400% change in microcirculation making *Gua sha* a unique phenomenon studied to date.

Perfusion comparisons: *Gua sha*, massage, and acupuncture

A comparison of other perfusion studies can help situate the significance of perfusion changes from *Gua sha*. Researchers have demonstrated increased skin blood flow from compressed air massage which immediately fell when treatment stopped (Mars et al., 2005). Laser Doppler scanning was used to demonstrate a small but significant increase in skin blood flow from 'de qi' acupuncture, both in the hand point needled (Li 4, Hoku) with short-lived spikes in skin blood flow up-meridian at elbow point LI 11 (Quchi) (Kuo et al., 2004). By contrast *Gua sha* maintained a change in perfusion for the full 25 min studied.

Sandberg et al. (2003) studied superficial and deep muscle blood flow changes from acupuncture needling, finding that acupuncture with a 'de qi' response increased superficial and deep muscle blood flow by 75% for the first 5 min after needling. In contrast, *Gua sha* increased superficial blood flow by 400% for the first 7.5 min, with significant increases maintained for the full 25 min period studied. *Gua sha* appears to sustain an increase in microcirculation greater and longer than massage or acupuncture.

That *Gua sha* is identified with a large increase in surface perfusion substantiates there is a measurable physiological impact of the technique. However, this represents a partial knowledge of *Gua sha*. It would be short-sighted to attribute the therapeutic effect of *Gua sha* to increase in microcirculation alone.

For example, each subject had a reduction in pain that persisted fully or to some extent at follow up. Immediate pain relief at the primary treatment site may be attributed to increased circulation, resultant warming, and venting of heat, i.e. thermoregulation that might alter inflammation

Table 1 Listed are some of the terms used to describe *Gua sha*, *cao gio* coining in Western medical literature (1975–2007), with definitions, comments on their misapplication and citations of the articles where the terms are used (Nielsen, 2007).

Terms	Definitions	Comments	Citations of articles using terms
Battery trauma, injury, abuse, torture, and strangulation	To injure; cause bodily harm.	*Gua sha* does not injure or harm a patient. Red ecchymosis is 'mistaken' for bruising.	Ashworth (1993), Bays (2001), David et al. (1986), Davis (2000), de Luna et al. (2003), Halder et al. (2002), Halder and Nootheti (2003), Heyman (2005), Hoffman (2005), Hulewicz (1994), Keller and Apthorp (1977), Levin and Levin (1982), Look and Look (1997), Mevorah et al. (2003), Morrone et al. (2003), Ngo-Metzer et al. (2003), Rampini et al. (2002), Shah and Fried (2006), Stauffer et al. (2003), Tuncez et al. (2005), Walsh et al. (2004), Westby (2007), Willgerodt and Killien (2004), Wong et al. (1999), Yoo and Tausk (2004).
Pseudo-battery, pseudo-abuse	False, fraudulent or 'pretend' battery or abuse.	Reinforces traditional medicine as 'pseudo' medicine. Does not clarify that harm is not inflicted.	Anh (1976), Du (1980), Gellis and Feingold (1976), Kaplan (1986), Primosch and Young (1980), Rosenblat and Hong (1989), Saulsbury and Hayden (1985), Yeatman et al. (1976).
Dermabrasion	A painful technique for removing scars or tattoos where the surface of the skin is removed by abrasion: sanding or wire-brushing. Skin is red, raw and takes several weeks to months to heal.	The skin remains in tact with *Gua sha*. There is no abrasion; the ecchymosis fade completely in 2–4 days.	Golden and Duster (1977), Kemp (1985), Dinulos and Graham (1999), Davis (2000).
Bruising	Trauma, injury or blow that causes bleeding from damage to capillaries and vessels. Takes weeks to months to heal and or completely disappear.	There is no injury with *Gua sha*. Seeping from capillaries is initial and transient with ecchymosis fading in days.	Campbell and Sartori (2003), Graham and Chitnarong (1997), Hefner et al. (1997), Hulewicz (1994), Kemp (1985), Mevorah et al. (2003), citing Hulewicz (1994), D'Allesandro and D' Allesandro (2005), Roberts (1988), Scales et al. (1999).
Burns	Injury to the skin caused by heat.	*Gua sha* does not involve heating the skin in any way but has been confused with fired cupping.	Amshel and Caruso (2000), D'Allesandro and D' Allesandro(2005), Rampini et al. (2002), Sullivan and Trahan (2007).
Dermatitis	Inflammation of the skin, typically referring to eczema.	Sha does not represent inflammation of the skin on the order of rash or eczema. Sha petechiae are transitory and fade in days.	Silfen and Wyre (1981).

Table 1 (*continued*)

Terms	Definitions	Comments	Citations of articles using terms
Factitial dermatitis	A primary psychiatric symptom: skin lesions or skin disorders created by or perpetuated by manipulation of the skin surface (Habif, 2004).	Sha is not true dermatitis and is not factitial in that *Gua sha* is most often applied by someone other than oneself.	Silfen and Wyre (1981).
Pseudo-factitial dermatitis	Skin condition that can lead the clinician to an erroneous diagnosis of factitial dermatitis. Author explains pseudo-factitial dermatitis does not exist.	Here sha is responsible for 'leading the clinician to an erroneous diagnosis.'	Lachapelle et al. (1994).
Pseudo bleeding	'Fake bleeding'; a term intended to eliminate bleeding as cause or comorbidity.	Clarifies sha does not represent blood thinning, low platelets or vascular problem.	Overbosch et al. (1984).
Nummular erythema	Coin shaped red lesions.	This term confuses *Gua sha* with cupping which results in nummular-shaped ecchymosis.	Campbell and Sartori (2003).
Purpura	A condition characterized by hemorrhages in the skin and mucous membranes that result in the appearance of purplish spots or patches 2 mm to 1 cm. May be secondary to platelet or coagulation dysfunction or vascular defect.	Incorrect histological definition of sha.	Leung (1986), Leung and Chan (2001), Ponder and Lehman (1994), Primack and Person (1985).
Cutaneous stigmata	Mark on the skin of infamy, disgrace or reproach indicative of a history of disease or abnormality.	Sha does appear on the skin and has been associated with disgrace, disease or reproach by the biased. Associates *Gua sha* with suffering.	Buchwald et al. (1992).
Hematoma	Localized swelling filled with blood resulting from a break in a blood vessel.	Sha marks are not the size of hematomas.	Ponder and Lehman (1994), Zuijlmans and Winterberg (1996).
Linear petechiae and ecchymosis	Small crimson, purple, red, or livid spots on the skin due to extravasation of blood. Ecchymoses indicates passage of blood into subcutaneous tissue marked by discoloration.	Most accurate medical terminology to describe sha though sha is not related to the morbidities typically associated with petechiae or ecchymosis.	Crutchfield and Bisig (1995), Dinulos and Graham (1999a), Lederman and Keystone (2002), Leung (1986), Leung and Chan (2001), Nielsen (1995), Roberts (1988).

and pain. But it is unclear how increase in microcirculation can account for pain relief that persisted for days since microcirculation returned to normal at follow up for each subject.

Moreover, laser scans were taken of a control area in each subject that had some level of myalgia before treatment. The control areas, distal from the areas treated with *Gua sha*, did not show an increase in surface microcirculation. Pain relief at subjects' distal areas that was immediate and also persisted at follow-up cannot be attributed to increase in microcirculation. There remains an as yet unidentified biomechanism(s) associated with pain relief observed from *Gua sha*, as well as biomechanisms associated with *Gua sha*'s ability to bronchodilate, reduce fever, and inflammation, etc.

Efficacy studies using *Gua sha* for neck pain, for example, are now being conducted at a hospital in Germany with very positive preliminary results. As *Gua sha* demonstrates efficacy for conditions will it continue to be categorized as 'folk' medicine, or as 'complementary alternative' medicine?

The language of integrative medicine

Recently a patient was referred to me by her oncologist. She had seen an acupuncturist close to her home but said she preferred our facility. At check out she was surprised to learn that there was a fee for her session. Her physician told her that acupuncture was complementary medicine and she assumed that meant 'free'. Complimentary and complementary sound the same even if the meanings are quite different. The term 'complementary' diminishes the relevance of any medicine that it describes.

Language and terms constitute a discourse. Words used to signify a therapy can themselves authorize it or demean it. Paradigms of medicine not based in modern scientific linguistics remain 'ghettoized' as 'complementary or alternative', or delimited by their domestic use and oral communication, and dubbed 'folk' remedies as in the American Medical Association's (1997) (AMA) *Folk Remedies among Ethnic Subgroups*. But East Asian medicine, Ayurveda, early Galenic medicine, and the medicine of Islam are traditional indigenous systems based in scholarly traditions with scholarly archives (Bates, 1995). Praxis may precipitate to and elevate from the non-erudite just as aspects of modern medicine are adapted within local domestic and family contexts. But local domestic contexts do not define any system. Delimiting traditional medicines to their oral rather than scholarly transmission is a colonial operation generally and in the case of East Asian medicine represents a racist 'Orientalist' position (Said, 1979, 1985).

The hegemony of science continues to position praxis outside of scientific culture as 'complementary and alternative,' even when studies prove benefit over standards of practice (Nielsen, 2007). Consider, for example, a study that compared acupuncture to exercise for pelvic girdle pain in pregnancy (Elden et al., 2005). Acupuncture was superior to exercise but both worked. The study conclusion stated that acupuncture and exercise 'constitute efficient complements to standard treatment' for management of pelvic girdle pain during pregnancy. However, no effective standard of treatment had been demonstrated (Stuge et al., 2003). Here then, therapies proven effective continue to be categorized as complementary or secondary essentially promoting an artificial hierarchy that blurs rather than clarifies best practice options.

The persistent use of terms like 'complementary and alternative' medicine (CAM) to describe therapies that stem from a 2000 year tradition and/or have demonstrated efficacy can be seen to be politically or culturally motivated. The goal of integrative medicine should be best practice based on best possible evidence and should not promote or sustain an artificial hierarchy.

To that end *Gua sha* is here described as a technique belonging to traditional East Asian medicine. *Gua sha* produces therapeutic petechiae and ecchymosis that are transitory and associated with significant increase in surface microcirculation. The increase in perfusion is a partial knowledge of the biomechanism of *Gua sha*. More study is necessary to elucidate other biomechanisms associated with its therapeutic effect.

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