Japanese Acupuncture - Current Research

Japanese Traditional Medicine Text (2) – Internal Medicine

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B Influences on Digenstive Tract Function due to Acupuncture

1. General Overview of Research

Compared to other countries, at an early date Japan started a long history of scientifically researching the effects of acupuncture and moxibustion on the digestive system.

In 1912, Jujiro Kashida et al., studied the effects of moxibustion on intestinal peristalsis in domesticated rabbits using a manometer. Stimulating ST36（足三里）as well as abdominal points with moxibustion they reported a transient acceleration that gradually became a resistance response to the stimulation[1]. Further, in 1914, Michio Goto observed an acceleratory response to moxibustion stimulation in the intestinal movement of rabbits[2]. Additionally, in 1929, Shuji Fujii et al., reported a resistance response to moxibustion in the small intestinal movement of rabbits[3]. Later, in the 1970's, Sato et al., and Noguchi, who played a leading role as Japanese researchers performed basic research, gradually clarified the mechanism by which acupuncture and moxibustion treatment influences the somato-autonomic nerve reflex thereby influencing the digestive system[4,5].

Concerning clinical research, in 1992, Li et al., presented Chinese acupuncture and moxibustion research on the subject of the digestive tract. In 1999, at a Symposium sponsored by the Japanese Society of Acupuncture and Moxibustion, a comprehensive review of basic and clinical research outcomes was presented[7].

Recently in foreign countries, due to increased public need, Irritable Bowel Syndrome (IBS) has frequently become the subject of research. In response the introduction of clear standards for IBS diagnosis, announced in Rome 2000, the resulting large supply of public funds for acupuncture research for treating IBS led to a sudden increase in research reports. As a result, Takahashi (2006) [8] as well as Yin et al. (2010)[9] reported a comprehensive review of acupuncture and moxibustion treatment for digestive disorders. The crux of the matter will be introduced below, where a relatively high proportion of the reviews introduces research on salivary secretion, gastric acid secretion and gastrointestinal disorders, especially IBS.

2. Acupuncture and Salivary Secretion

Research on Acupuncture and salivary secretions precedes the conditions of clinical research, Blom et al. (1992)[10] reported, when compared to the placebo control group, patients with dry mouth associated with Sjogren's syndrome experienced significant increases in salivary secretions following needle retention acupuncture. Additionally, Dawidson et al., reportedly confirmed the mechanism for increased salivary secretions following acupuncture was thought to be due to an increase in blood vessel dilatory factors such as CGRP[11] and VIP[12] leading to improved circulation to salivary glands. O'Sullivan et al.[13] emphasized the importance of extremely accurate acupuncture RCTs to assure clinical effectiveness and patient safety. This groups clinically evaluated 3RCTs demonstrating that acupuncture effectively mitigated the dry mouth that often results as a side effect of radiation therapy for head and neck cancer patients. Omata et al., conducted clinical research and reported in Japan that high frequency electro-acupuncture on facial points increased salivary secretions and mitigated dry mouth symptoms associated with Sjogren's syndrome[14]. Further, Omata et al. reported in 2007 that at the time of high frequency electro-acupuncture stimulation (1Hz and 30Hz) measurable VIP emissions caused blood vessel dilation that led to

significant increases in secretions such as tears, the amount of salivary secretions and facial skin temperature changes. Tears and salivary secretions were confirmed to increase with 30 Hz electro-acupuncture stimulation[15].

As reported above, acupuncture treatment has been clinically shown to increase salivary secretions, however, the functional mechanism of that process has yet to be convincingly clarified. It has been suggested that increased blood flow to an area as a result of increased blood vessel dilation factors in the area would accelerate secretions, however further research is thought to be necessary (Table 1).

Table 1 Salivary Secretion

Author	Year of Publication	Subject,Object of study	Number of Cases	Method of stimulation	Conclusion	Journal
Blom M.	1992	Xerosis	21	Needle Retention Technique vs. Sham needling (Shallow needl ing)	Salivary Gland Secretion increase due to shallow needling	Oral Surg Oral Med Oral Patho
Blom M.	1996	HNC	38	Sham Acupuncture (1 cm far from acupoint & shallow needling) vs. Manual Acupuncture stimulation	Salivary secretion increase due to acupuncture,shallow acupuncture and no significant difference Manual acupuncture stimulation	Eur J Cancer, B. Oral 0ncol
Dawidson I.	1998	Xerosis patient	65	Manual Acupuncture with Qi arrival	Increased Salivary secretion, increased VIP concentration within the saliva	Neuropeptides
Dawidson I.	1999	Xerosis patient	65	Manual Acupuncture with Qi arrival	Increased Salivary secretion, increased CGRP concentration within the saliva	Neuropeptides
Omata H.	2000	In both Sjogren's syndrome and healthy subjects	Healthy subjects =10 Subjects with Xerosis =10	Electro-acupuncture in the cervical (neck) area/ Facial area electro-acupuncture	Effectiveness of facial electro-acupuncture (20Hz), Dray Score improvement	The Japan Society of Balneology, Climatorogy and Phsical Med
Omata H.	2007	In both Sjogren's syndrome and healthy subjects	Healthy subjects =10 Subjects with Xerosis =11	Facial electro-acupuncture 1Hz vs. 30Hz	Increased tears volume following 30Hz electro-acupuncture, 1 and 30Hz electro-acupuncture causes increased saliva volume, facial epidermis temperature increase with 1 Hz electro-acupuncture	The Autonomic Nervous System
Cho JH.	2008	HNC	12	Needle Retention Technique vs. Sham needling (Shallow needl ing)	Acupuncture and shallow acupuncture causes an increase in salivary gland secretion, subjective symptoms significantly improved	J Altern Complement Med
Pfister DG.	2010	NHC	58	Manual acupuncture stimulation vs. standard acupuncture treatment	XI Score significantly decreased with acupuncture	J Clin Oncol

3. Acupuncture and Gastric Acid Secretion

It is thought that Sodipo et al.[16], were among the first European and American researchers to report on the effects of Acupuncture therapy on gastric acid secretions. These researchers used a 6 week protocol of acupuncture, moxibustion and electro-acupuncture on patients with duodenal ulcers and non-ulcerative indigestion. The patients reported elimination of stomach pain and, within the duodenal ulcer group, because there was a reduction in maximum-stimulation gastric acid secretion the researchers concluded that acupuncture inhibits gastric acid secretion in these patients.

Within the field of basic research, Zhou et al. (1984), treated and unanesthetized dog with a gastric fistula using electro-acupuncture on ST36(足三里), PC 6(内関), and UB 21(脾俞) for 2 hours and observed inhibition of gastric acid secretion, this response was reported as inhibition of gastric acid secretion by the somato-autonomic nerve reflex because the reaction disappeared with the administration of the Vagal nerve blocker Atropine and/or local anesthesia, procaine[17].

Also, Jin et al., observed that acupuncture stimulation was capable of inhibiting amino acid induced gastric acid secretion in under conscious dogs. Because this reaction was eliminated by naloxone, it was thought that endogenous opioids must be related to the pain relief mechanism of acupuncture related pain relief [18].

On the other hand, Noguchi et al., observed accelerated gastric acid secretion in anesthetized rats treated with electro-acupuncture at ST36. Because this reaction was eliminated by severing the Sciatic and/or Vagus nerves, it was reported that the accelerated gastric secretions must involve the somato-autonomic nerve reflex[19].

Currently, there are numerous reports concerning gastric secretion resulting from acupuncture stimulation, unfortunately the results and hypothesized mechanisms remain unclear. Furthermore, given recent developments in pharmaceutical treatments and elucidation of the mechanisms involved in ulcer occurrence, the importance of clarifying and reporting on acupuncture's role in controlling gastric acid has been diminished (Table 2).

Table 2 Gastric Acid Seretion

Author	Year of Publication	Subject,Object of study	Number of Cases	Method of stimulation	Conclusion	Journal
Sodipo J	1979	Gastric Ulcer patient	10	Retention method of Acup., electro-Acupuncture, Moxa on sliced ginger	Reducing gastric ulcer pain is related to reducing the amount of gastric acid secretion	Am J Chin Med
Zhou L	1984	Conscious dogs	5	Electro Acup. vs. Manual Acup.	Sham Acup. <Manual Acup.<Electro-acup. reduces gastric acid secretion	Life Sci
Jin H	1996	Conscious dogs	5	No stimulation vs. Shallow Acup. vs. Electro-Acup.	Acupuncture shown to suppress gastric acid secretion following amino acid ingestion	Am J Physiol
Noguchi E	1996	Anesthetized rats	56	Electro Acup. on St 36 (足三里) vs. LI 10 (手三里)	Electro-Acup. at ST36 accelerated Gastric acid secretion	J J Phsiol

4. Acupuncture and Gastrointestinal Dysfunction

Li et al.(1992) , reviewed 25 reports, published between 1979-87, on the role of acupuncture in gastrointestinal function and disorders. A majority of the reviewed papers (17) used basic research papers, whereas only 8 reports used human subjects for functional and clinical research [6].

Since 1997, the National Institutes of Health, NIH have announced a general consensus with respect to acupuncture and have generously made funds available for further research. As a result, numerous reports on the usefulness of acupuncture for stomach and intestinal function have been published by American Medical Universities [20]. Takahashi (2006)[8] reported on the above results, focusing on acupuncture and functional gastrointestinal disorders. In the following section we will summarize the Yin et al., report on gastrointestinal motility disorders (2010) [9].

Recent studies on acupuncture treatment for gastrointestinal disorders reflects a growing social need, so IBS research has been conducted quite energetically. For these reasons the following two reports (2006, 2007) were selected for this systematic review. Lim et al.(2006), used online databases PubMed, the Cochrane Central Register of Controlled Trials (CENTRAL) on *The Cochrane Library*, EMBASE, the Chinese Biomedical Database, the Cumulative Index to Nursing and Allied Health (CINAHL), and the Allied andComplementaryMedicineDatabase (AMED) to analyze and extract 6 relevant clinical studies (Table 3). The results did not confirm statistically significant differences in studies where sham acupuncture was set up as a group to be compared to standard acupunctures, but did report that when acupuncture was set as the control group symptoms often improved [21]. However, a large portion of the reviewed clinical papers were of low quality and although meta-analysis was attempted, only 2 reports were worth analyzing. For these reasons, it is difficult to make a judgment about the effectiveness of acupuncture, sham acupuncture (shallow acupuncture) or another intervention for IBS.

In 2007, Schneider et al., investigated all the clinical papers related to acupuncture used to treat gastrointestinal disorders on MEDLINE (submitted until 2006) (Table 3).

Their results included 18 extracted reports, from these they selected 4 RCTs that met the standard criteria and used these for their systematic review. The subject of two of these papers was Irritable Bowel Syndrome (IBS) and Chrohn's Disease (CD), one paper discussed Ulcerative colitis and one discussed Inflammatory Bowel Disease (IBD). Discussion within these papers related to the usefulness of acupuncture and sham acupuncture (shallow acupuncture) for these conditions as well as whether or not the patient's quality of life (QOL) significantly improved. Acupuncture treatment was found to be significantly more effective for patients with Chrohn's Disease and Colitis than sham acupuncture(shallow acupuncture) regarding the activity of the disorders (CAI score). From these results, it has been thought that the effect acupuncture may have on QOL for IBS patients is non-specific, but because the possibilities are detectable, there is a clear imperative for further research [22].

In this way, it has been suggested that acupuncture has the potential to be effective for IBS, Chrohn's Disease, Ulcerative colitis, etc., and other gastrointestinal function disorders, but this conclusion has not been fully verified.

However, according to MacPherson et al.(2010), they currently have 233 IBS patients whose results are being analyzed and they anticipate publishing a new systematic review [23](Table 3).

So while these two systematic reviews at once give the impression that the possibility of effective acupuncture exists, there is also the impression that both acupuncture and sham acupuncture provide

little more effect than a Placebo. The origin of these conclusions are strongly reflected in the current research model that equates "sham acupuncture" with a "non-invasive control", when this assumption has not been universally approved. When using sham acupuncture as a control (non-invasive, non-stimulation = placebo) differing "doses" of stimulation have been confirmed. That is to say, the stimulation from sham or non-invasive stimulation (as a control or a placebo) is thought to be sufficient to provide a therapeutic effect.

As for Japan, conducting acupuncture and moxibustion RCTs has been relatively difficult, in fact, in recent years Japan has contributed almost no meaningful clinical research RCTs. However, in light of some outstanding recent report using acupuncture to treat IBS that utilizes an inversion method, it is now being thought that methods besides RCTs that are still evidence based medicine (EBM) are certainly possible [24]. Moving onward from this point, it is now necessary to confirm acupuncture and moxibustion research methodologies in Japan.

Table 3 Lim's Systematic Review, The Cochrane Library, 2005

No.	Author	Year of Publication	Category	Subject, Object of study	Number of Cases	Method of stimulation	Conclusion	Journal
1	Fireman Z	2001	RCT	Israeli Patient with IBS	25	LI4(合谷) stimulation vs. Sham acup. (UB60:崑崙)	Comparing Acup. with Sham Acup. treatment, Abdominal pain as well as over all complaints were improved, there was no significant difference in improvement between the 2 groups.	Digestion
2	Forbes A	2005	RCT	English IBS out patient	59	Chinese Acup. vs. Sham acup. using non-meridian points	Acupuncture seems to be superior to Sham treatments, but there is no significant difference. Accordingly, Acupuncture has relatively little effect on IBS	World J Gastroenterol
3	Liao YC	2000	RCT	Chinese IBS Patient	97	Chinese Acup. with Psychological Counseling vs. Chinese Herbal Medicine with Psychological Counseling	Acupuncture with Psychological Counseling is more effective than Chinese Herbal Medicine with Psychological Counseling	Clin Acup & Mox
4	Liu M	1995	RCT	Chinese IBS Patient	37	Chinese acup., Ear acup., Western drug treatment	Ear acup. is more effective than Western drug treatment	Shanghai J Acup & Mox
5	Liu GZ	1997	RCT	Chinese IBS Patient	50	Chinese Acup. vs. Chinese Acup. with Psychological Counseling	Compared to using Acup. alone, Combining Acup. with some counseling is more effective	Chin Acup & Mox
6	Lowe C	2000	RCT	Canadian Patient	28	Chinese Acupuncture vs. Sham Acupuncture by blunt needles	Acupuncture is not especially effective for IBS	Gastroenterology

Table 3 Schnelder's Systematic Review, World J Gastroenterol, 2007

No.	Author	Year of Publication	Category	Subject, Object of study	Number of Cases	Method of stimulation	Conclusion	Journal
1	Forbers A	2005	RCT	IBS Patient	59	Chinese Acup.vs. Sham Acup. (Non-meridian points)	Acupuncture is superior to Sham Acupuncture but there is no significant difference. Further, Acupuncture is not especially effective for IBS	World J Gastroenterol
2	Joos S	2004	RCT	Patient with Chrohn's Disease	51	Chinese Acup. and Mox. vs. Sham Acup. (shallow stimulation on meridian points)	In line with CAI, acupuncture is considered more effective than Sham acupuncture.It appears that Acupuncture is moderately effective for Chrohn's Disease	Digestion
3	Joos S	2006	RCT		29	Chinese Acup. and Mox. vs. Sham Acup. (shallow stimulation on meridian points)	In line with the Colitis Activity Index (CAI), Acupuncture is considered more effective than Sham acupuncture, but considering QOL there is no difference between the two. It appears that Acupuncture is moderately effective for ulcerative colitis (UC).	ScanJ Gastroenterol
4	Scheider A	2006	RCT	IBS Patient	43	Chinese Acup. vs. Sham (Streitberger) acup.	Both Acup. and Sham Acup. contribute to an improved QOL for the patient. Acupuncture`s effect is mostly attributed to the Placebo effect.	Gut
5	Liu GZ	1997	RCT	Chinese IBS Patient	50	Chinese Acup. vs. Chinese Acup. with Psychological Counseling	Compared to using Acup. alone, Combining Acup. with some counseling is more effective	Chin Acup & Mox
6	Lowe C	2000	RCT	Canadian Patient	28	Chinese Acupuncture vs. Sham Acupuncture by blunt needles	Acupuncture is not especially effective for IBS	Gastroenterology

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General view of research

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