Acupuncture for Pain Relief

Dr S. Lipton

I am extremely pleased and delighted to be asked to this second World Congress of Scientific Acupuncture though at the end of my talk you may wonder whether I believe that word "scientific" is justified. I must state that I consider myself honoured to be here. The title of my talk should I think read 'Acupuncture and Pain Relief' not 'Acupuncture for Pain Relief'. Many people who have already spoken have demonstrated relief of pain by acupuncture and indeed Prof. Martelete's Plenary Session described the value of acupuncture in some detail with a convincing success rate in many conditions and with frankness in those cases where her results differed from others.

I want to start by taking you back to 1972. There had been by then various delegations to China, the Chinese being busy exporting acupuncture anaesthesia. As each delegation went and came back the percentage of successful acupuncture anaesthesia patients seen, using nothing but acupuncture, fell. It fell from a high level - well over 75% until I spoke to Prof. Patrick Wall who said he estimated it at about 8%. Note this was nothing else but acupuncture. Most patients he saw needed a supplement and some needed therapeutic anaesthesia in our conventional fashion. Nevertheless it existed.

Around 1972 one of our group Dr David Bowsher was asked by the Medical Research Council to see if there was anything in acupuncture that was useful to our medicine. I had better explain that the Centre for Pain Relief at Walton Hospital in Liverpool had a large pain clinic and a research group, both on multidisciplinary lines. In addition Dr Bowsher himself had a long record of successful research, had worked in the physiology of pain pathways for a long time and was well known to the Medical Research Council.

He examined the literature available - I won't say he read it, as it was almost unreadable, mostly consisting of literal translations from Chinese sources, was entirely about classical Chinese acupuncture and mostly anecdotal. He decided that we must run our own clinical trial and therefore we needed a recognised acupuncturist. What is more we needed a medical acupuncturist because in those days we believed you as a doctor if you worked with anybody who was not on at least the auxiliary registers. So you could not allow your patient to be treated by anybody except another doctor. We found two medically qualified acupuncturists, one was rather old, the other was Dr Mann. Now just think this was only 14 years ago. We asked him whether he would come and demonstrate and if so what type of patient he wanted and the conditions he needed and so on.

Well he agreed to come, and we got the type of patient he wanted. We got them by asking all our hospital departments to produce patients of the required type with pain that our departments had not been able to cure at all. Dr Mann had said he did not mind this arrangement. It meant that these patients were their own controls. There was no problem here of double blind crossover studies and placebo reactions, and of course each department gave its selected candidates another going over of investigations to make sure they had a cast iron, guaranteed incurable patient. The rest is history, he obtained 60% of them relieved either totally or near enough. The various clinicians, who were invited, were convinced that they had seen a new physiological phenomenon. We knew it had to be a physiological phenomenon because the body works that way and we also suspected that the theory of Chinese classical acupuncture was incorrect and stupid in a western setting.

Think what Felix Mann did — after all he went to a University Hospital Department of Medical and Surgical Neurology — and everybody world-wide knows how meek and mild and gentle and considerate of others neurosurgeons are — and demonstrated his skills in what must have seemed a hostile setting. I would like to pay tribute to this and thank him for it. Out of that day's work came the first acupuncture paper carried out reasonably scientifically in this country in one of the two major medical journals, namely the Lancet in 1973. This started a wave of interest in academic circles to investigate the new subject and it became acceptable to use acupuncture in hospital practice — gradually.

Being a Pain Relief Centre we tried it on everything we laid our hands on. I went to Dr Mann's course — at vast expense but the interesting thing is the Regional Hospital Board paid for it. We became very suspicious of the pulse diagnosis and soon stopped it. Now that seems to be accepted.

It seemed best for migraine, but not the migraine most patients get. We reasoned that the standard rugs were quite adequate for the majority of cases but we saw some with really severe migraine — attack after attack lasting days or one attack a month lasting a week and these did not respond to conventional treatment. When they had been properly and fully investigated by our own or another neurological unit and there was no satisfactory treatment, acupuncture was used. We used 2 of the 4 points of Ll 3 or Hoku and because these patients were lying down I usually used Ll 3. The first was a tremendous result, the attack stopped within a few hours — in fact it began improving almost immediately.

The second was a disaster — it made her much worse. In fact I phoned Dr Mann who suggested 1 had over stimulated and to wait till the next attack and then do a smaller stimulation. He suggested just putting one needle in the tissues and then out. This was what was done and it worked perfectly. I've now acquired 9 of these patients, 6 not necessarily perfect but very good
results, 1 so so — poor and 2 complete failures. The thing is I have only used one point since the second patient so I suspect that so long as you pick a good acupuncture point that is one with major neural connections — you only need one or perhaps just one like that plus a dermatomal one.

In whatever way acupuncture works it must work through a physiological mechanism. If we do not know how it works it merely means we do not know the physiology. It does not mean that acupuncture points have magical properties. It means that the ancient Chinese empirically have found a way of making the body mechanisms work in a particular direction.

There are undoubtedly a lot of body mechanisms we do not yet understand but there are many that we do understand and logically acupuncture pain relief mechanisms must work through those we do understand. I want to spend a little time on this thought.

Modern pain transmission starts with small and large nerve fibres in the periphery and their organization into what we call the gate control theory. You may not know the details of how this theory arose. Ron Melzack and Pat Wall sat down one night and chatted. They decided enough was enough about the transmission of pain in the human and enough experimental work had been done in both human and animal for it to be a reasonable bet that, if they really thought about it, they could come up with a good approximation to the correct method of pain transmission — which is what they did, they came up with the gate control theory of pain. Now I think that what they did for pain control we may do for acupuncture mechanisms but probably not so accurately since we know much less about the basic processes.

We have a few things to go on. As you know the spinal cord is arranged in layers and nociceptive information once it has passed the gate passes through these layers, in effect they act as a filter, because if the stimulation in one layer is not great enough it is not passed on to the next layer and ultimately if it is strong enough it passes through all the layers and is onwardly transmitted to the thalamic region and eventually perhaps to consciousness and on the way to the reticular formation. What goes up usually comes down and so we have the known descending serotonergic pathway through the raphe nuclei back down to the gate area. The upper end of the descending pathway is near the periaqueductal grey matter and that can be triggered and inhibitory neurons release endorphin near the gate and block it. The analgesia produced by this mechanism can be quite profound. This ascending pathway is not the only one, just as the descending pathway I have described is definitely not the only one.

We now know of the presence in the body of a whole series of endorphins. These substances are breakdown products of an even larger molecule, which can break down to a number of different hormones, depending on where it splits. Substances such as lipotropin and β-endorphin are smaller parts of this series. The ends of these substances which contain the enkephalin, met-enkephalin and leu-enkephalin act as transmitters at receptor sites. In the hypothalamus there is the largest concentration of endorphins known and these do not have analgesic properties.

Many ingenious theories have been devised to explain how destruction of the pituitary gland and the release of these non-analgesic endorphins can produce pain relief.

Much has been made of concentrations of endorphins in the cerebro-spinal fluid (CSF) and the blood but it is probable that these are an overflow phenomena and themselves have no significance. In other words they do their job elsewhere and the excess spills out into the CSF or blood circulations. What can they do? What could be their purpose? We are coming round to the viewpoint that they are messengers and if the genetic code is able to work on the information provided by a basis of four amino-acids, a collection of endorphins with 30 or more should be able to pass on huge amounts of information. Maybe this is the mechanism by which pools of neurons are set in a particular direction. They could be set up as more responsive or less responsive and this could happen to a few, or many, or a whole field. This could happen very quickly.

It is known that nerve cells are 'aware' (I use that word for want of a better one) when their axons are damaged. There is a constant transmission of substances centrifugally and centripetally along the axon and, when this is damaged, this movement is interrupted. We know some of these substances. In nociceptive fibres there is substance P and in others, there are endorphin-like substances. The peripheral end of a damaged axon dies and after a time sprouts appear at the proximal end. These are exceedingly sensitive to vibration and non-adrenaline and can be exquisitely painful. This is why a sympathetic block will relieve the pain for a time. This type of injury can on occasion progress to a neuroma and then becomes a much more chronic problem.

When a peripheral sensory nerve is damaged near the ganglion again a very chronic and often burning pain develops. Finally, if the nerve connections are damaged proximal to the ganglion cell, another type of remarkably severe and very prolonged chronic pain results from deafferentation.

To return to the descending pathways, Judith Walker and Ronald Katz in a research report in 1981 in the journal 'Pain', showed that subcutaneous electrical stimulation of median, radial and saphenous nerves produced prolonged analgesia which was not naloxone reversible. It is a short but meaty article and they suggested that non-endorphinergic pathways can produce powerful analgesia. The interesting feature of this work was the relative stability and permanence of the relief of pain. This type of mechanism should be present because from time to time — not very often — one sees a severe chronic pain stop without any reasonable explanation.

In causalgia when a nerve is damaged the severe pain can come on immediately in a few hours and then it lasts. In some way the particular neurones which occupy the receptor field for that part of the body become ultra sensitive, or they enhance the sensation from that part. What is more, on occasions it is done in a matter of seconds. There are well authenticated case histories of soldiers being shot with a bullet passing close to a large nerve, but not tearing it, and from that
moment on until their death they suffered the pain. Nowadays we try sympathetic blocks. These work in a very high proportion of patients but what we should know is how one injury can switch it on and one sympathetic block can switch it off. What is “it”, what is being done and what is it being done to?

Now to come back to acupuncture. Whatever else it does, acupuncture stimulates nerve fibres. Acupuncture points are places of high nerve density, where nerve fibres ascend to the surface from the deep fascia. There are some sympathetic fibres with them which arborise in the skin and supply sweat glands. My colleague, Dr Bowsher, Reader in Anatomy at Liverpool University, provides this information. That is why acupuncture points have a slightly lower electrical resistance than the surrounding tissue. The sensation obtained when twirling an acupuncture needle at an acupuncture site, which the Chinese call Der Chi, was described, so Dr Bowsher assures me, in early physiological writings as due to the presence of sympathetic fibres and it does not occur unless there are sympathetic fibres present. This may account for why we sometimes cannot get Der Chi. The intense stimulation of the nervous system may bring into action the switching mechanism I’ve mentioned, or it could release messengers which have the same effect and probably in any case use long lasting descending pathways, which may be opioid or non-opioid.

The speed of action of acupuncture suggests that there must be a sudden alteration of neuronal sensitivity. I have only been talking about and postulating about my own field which is pain relief. How acupuncture has its effects in other modalities I leave for somebody else to speculate but I’m sure it will have to be by a basic neural mechanism.

So I am suggesting firstly that anatomically there are three ways neurones can be damaged and that these three produce three different types of pain. Secondly, there are pools of neurones connecting the peripheral neurone with higher centres and that appreciation of the peripheral sensation depends on how the grain of these is set — high or low. Thirdly, there has to be a rapid mechanism for switching from high to low and vice versa. Fourthly, acupuncture may provide one of the initiating mechanisms through the switch and finally probably the endorphin system provides the messenger system. J S Morley has been writing on this subject in the biochemical journals recently.

Well so much for theory. Acupuncturists like other medical practitioners can only take so much new theory but there is one other field where we are lacking. We complain (that means I complain) that a lot of the work that has come from China so far is anecdotal. So is a large portion of the work that comes from the British acupuncture scene. I am reminded very much of the research that anaesthetists in the British Isles did up to the point when they became consultants in the new National Health Service in 1948. They were regarded by the other consultants as not quite being proper consultants. The Faculty of Anaesthetists of the Royal College of Surgeons started a programme of improving the quality of the work done by its members and began to insist on fairly rigid statistical proof in research. At the very least one had to state whether the work you were publishing was significant or not. We had to fill the journal so it couldn’t be too rigid at first but the message gradually got across and now the anaesthetic journals are regarded as containing very high class work indeed. Acupuncturists need a similar approach. Usually as soon as I mention statistics a glazed look comes over my colleagues’ faces and they say things like “I work on my own” or “I can’t make those evaluations”; “It is too much book work”. You would think that all they write (and I suspect it is all they do write) is “Pain in the foot no better” Liv 3, II 4, Bladder something or other 30 minutes, medium frequency. Return tomorrow, next week. Keeping records is not difficult, it is habit and method and in particular if you remember in this country your notes are all that stand between you and medico-legal problems. One learned judge a year or two ago advised a group of doctors to “put it in the notes”. If it is written down I’m inclined to believe the doctor, if it isn’t I attend to the patient.

When you plan an investigation it is important to understand how many cases you need in order to be sure of getting a significant answer. In complicated research it is always best to use a statistician. There are snags in this but if you remember it is the statistician’s job under these circumstances to make 101% sure the results will be significant and so they will pile additional safeguards on until it is impossible to carry them out — this is why we tend not to go to them. But we have to if we are going to be accepted by the scientific community. We have to argue that at a certain level of information gathering the difficulty of carrying on clinical life totally outweighs the benefit.

When penicillin was being evaluated, very few animals were necessary. Without penicillin they all died from fulminating infections and with it they did not die. Under these circumstances all one requires is at the most 7 or 8 animals to be significant. Of course there are snags. One animal — I think the guinea pig — is sensitive to penicillin and dies, so if that animal had been used there would have been 100% mortality. That is why, in the animal work, for drug trials several different species are used.

There are two chapters by J A Campbell written for Pain Relief in Persistent Pain, volumes 2 and 3 and also a paper by Lewith and Machin in Pain 1983, pp 111-127 which give some of the possible methods of statistical control which are reasonably easily understood.

I would suggest you acquaint yourselves with simple statistical methods using squares, variance, normal distribution curves, standard deviations. We can only expect acupuncture to be accepted by the medical and scientific world as a valid treatment, if we are prepared to apply statistical methods of evaluation to well planned and controlled clinical trials.

Dr. Sam Lipton
Centre for Pain Relief,
Walton Hospital,
Liverpool, England
Acupuncture for pain relief

S Lipton

doi: 10.1136/aim.5.2.26

Updated information and services can be found at:
http://aim.bmj.com/content/5/2/26.citation

**Email alerting service**

Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

**Notes**

To request permissions go to:
http://group.bmj.com/group/rights-licensing/permissions

To order reprints go to:
http://journals.bmj.com/cgi/reprintform

To subscribe to BMJ go to:
http://group.bmj.com/subscribe/