

Communication

Auricular Interventions in Neurology: the Vascular Autonomic Signal Challenge

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Abstract

The Auricular approach to diagnostics and therapeutics has gained momentum over the last 15 years. Battlefield Acupuncture has taken on a life of its own and has been adopted into NATO and even been introduced into neonatal intensive care. It is time to take on the challenge of Auricular Medicine - the application of the neurophysiological phenomenon referred to as the Vascular Autonomic Signal or VAS to identify active ear sites in Auricular interventions. It is time to utilize the VAS in therapeutics, recognizing its potential for recording the healing process.

Keywords

Auricular medicine; neurology; public health



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1. Background

The escalating costs of health care delivery has become a major issue for many countries and there is an urgent need to seek new approaches which can be taught to clinicians world wide and applied to patient care effectively and more economically. This is our challenge as a world community. Currently of major concern is the opioid crisis. The devastation to the affected individuals and their communities, as well the cost to society in general, has now reached critical status. In 2017, the opioid crisis has been declared a health emergency in the United States. In Australia medications containing opioids are no longer available over the counter as of February 2018. There is no doubt many more countries will adopt stricter policies in the future. Let us all rise to the challenge and work together to implementing affordable health strategies. In this communication, Auricular Medicine is explored for its potential in delivering affordable diagnostics and therapeutics.

2. The Vascular Autonomic Signal

Auricular Medicine is the system of auricular clinical diagnostics and therapeutics that utilizes the neurophysiological phenomenon commonly referred to as the Vasculo-Autonomic Signal or VAS. [1-3]. The VAS is also known as the RAC or Reflex Auricular Cardiac. The VAS is underutilized today. Documented half a century ago by a French physician Dr Paul Nogier, it has been neglected or ignored by many clinicians. Today the time has come for more clinicians to explore the VAS and seek its relevance in diagnostics and therapeutics. The changes in the VAS (best identified at the radial pulse as amplitude changes) is linked to changes in the body's autonomic status and also the integrity of the body's interior and exterior functionality.

In 2017, the VAS was clearly identified as a dynamic representation of the interplay between the Vagal and Sympathetic response with the former recording the subtlety of short duration effects and the latter recording the longer duration effects [4, 5]. It is important to note that Moser et al described the interactions not only between the high frequency vagal response and the low frequency sympathetic response, but how these interactions had an effect on the electrical field of the individual.

This was recognition of the presence of every individual's electrical field or electromagnetic field and the possibility of field changes with environmental shifts.

It can be used to identify auricular (and body acupuncture) sites requiring attention or treatment. Currently the VAS is located using one's thumb or other digit at the radial pulse seeking an increased or change in pulse amplitude when the auricular site being screened or tested is dysfunctional. It is a sign indicating that particular auricular site requires intervention. [1-3] Many clinicians use a pressure device to induce pressure pain to identify these auricular dysfunctional sites. *It has to be considered that a non- pain inducing approach in identifying these dysfunctional sites may be advantageous as it avoids stimulation or over activation of the pain pathways.* The VAS is also known as the Nogier Reflex in some countries such as Germany. Currently, new methods are under development for identification and utilization of the VAS. [6]

3. Neuroimaging Evidence

Auricular point specificity has been studied [7] as has the anatomical and functional aspects of stimulating auricular knee points [8]. The central pain control regions of the anterior cingulate and

the thalamus were also shown to be involved in BFA [9]. More neuroimaging studies especially functional magnetic resonance imaging are required to better document the dynamic relationships between auricular stimulation, cranial nerves activation and access to relevant brain regions and their feedback responses or their top down effects. Low level laser acupuncture to depression specific acupuncture points regulates at the default mode network as part of its central mechanisms [10, 11]. This may be part of the central mechanisms for auricular medicine.

4. Auricular Neurological Access to the Brain

The foundation of auricular interventions has been its innervation and access to the central nervous system. [12] Clinically Auricular Medicine has been used world wide for many decades due to its empirical effectiveness without strong biological evidence. It has only been in recent years that the central mechanisms have finally been identified. The connectivity of the auricular branches of the trigeminal (Cranial Nerve 5 or CN5) and the vagus nerve (Cranial Nerve 10 or CN10) to the cortical, subcortical brain regions and the rest of the nervous system networks has finally been revealed. [11, 13-15]

The auricular branch of the superior cervical ganglion has direct access to the sleep control or circadian rhythm brain regions at the supra-chiasma centre for melatonin regulation. [16, 17]

The Vagal regulatory capabilities of auricular medicine has an important part to play in the reducing the inflammatory effects in many of today's diseases. Vagal afferents in body tissue have inflammatory receptors for cytokines. Auricular Medicine's vagal access for homeostatic re-regulation holds the key to down-regulating this inflammation response by reducing cytokine production via nicotinic acetylcholine receptors as found on macrophages. [18, 19]

With these recent findings, the role of Auricular Medicine in the brain to body's psycho-neuro-endocrin-immunological regulation has finally been made clearer.

5. Clinical Applications

Acupuncture has been useful in the fight against the opioid crisis for the management of pain conditions. [20] Leading the advance has been the remarkable growth in interest and subsequent increase internationally in the clinical application of an auricular intervention referred to as Battlefield Acupuncture or BFA. [9] Although its architect, retired United States Air Force Colonel Richard Niemtzow, developed it for acute pain management in the battlefield, its principals and mechanisms for controlling central pain has been implemented in other clinical settings including in neonatal intensive care units to reduce pain and suffering and preserve the cellular integrity of the developing cortex and sub-cortex [21-27]. Acupuncture in paediatrics has long been established [28, 29] and it is of even greater interest to implement Auricular Medicine at the neonatal stage in life. It may well be protective of good health to start at this neonatal stage and much remains to be done with further investigations.

The National Acupuncture Detoxification Association (NADA) has also developed an auricular protocol for the treatment of addictions and related psychological change [30]. Low intensity laser as a modality for auricular acupuncture in patient care has also been helpful.*- [31] Auricular intervention for cancer pain has been found to be effective [32].

At the 9th International Symposium on Auriculotherapy in 2017 [33], it was clear that Auricular Medicine has an overwhelming evidence base for successful implementation clinically in many fields of medicine. The most outstanding current research projects studied how auricular

stimulation helped: 1) to reduce amyloid deposits in the dementia brain by improving glymphatic clearance rates, 2) how auricular stimulation re-regulated functional connectivity at the brain to successfully treat depression, and finally, 3) by identifying active ear foci in neonates one is able to predict the illness rate or negative health events rate by the number of active foci at the ear.

6. DOSAGE: How Much Is Enough?

Currently, when applying auricular needles, ear pressure seeds or magnets, there is no quantifiable measure for how long they need to be left in place nor how frequently the intervention has to be repeated and at what intervals. Moving forward, the challenge is to use modalities such as low level laser as the intervention of choice. Using the VAS to detect how much is enough laser, it will be possible to, at each time point, upload the correct quantity of laser energy to effect a positive shift in neurophysiological change for each patient.

These energy uploads can be recorded and has been shown to reduce (as the patient condition requires less energy transfer for the healing process as it gets better) over time with patient recovery. [34]

7. Conclusion

As health care systems approach overload, the realization that there has to be better solutions to rein in health dollars, still deliver effective and affordable care, is high on the list of priorities for every government. Today Auricular Medicine has strong biological and clinical evidence for its application within health care delivery. The next challenge is to validate the Vascular Autonomic Signal to better predict durations of treatments required for the restoration of good health.

Author Contributions

The author is responsible for the entire process of writing up, revising, and approving the final version of this manuscript.

Competing Interests

The authors have declared that no competing interests exist.

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