



A cross-sectional analysis of patient characteristics, health conditions and patient experience at a Portuguese medical acupuncture teaching appointment



Carlos Miguel Marto^{a,b,c,d,e,*}, Preslava Ouzounova^c, João Casalta-Lopes^{b,d,f},
Maria Filomena Botelho^{b,d,e}, António Cabrita^{a,g}

^a Experimental Pathology Institute, Faculty of Medicine, University of Coimbra, Portugal

^b Biophysics Institute, Faculty of Medicine, University of Coimbra, Portugal

^c Institute of Integrated Clinical Practice, Dentistry Department, Faculty of Medicine, University of Coimbra, Portugal

^d Coimbra Institute for Clinical and Biomedical Research (iCIBR), Area of Environment Genetics and Oncobiology (CIMAGO), Faculty of Medicine, University of Coimbra, Coimbra, Portugal

^e CNC.IBILI Consortium, University of Coimbra, Portugal

^f Radiation Oncology Department, Coimbra University Hospital Centre, Portugal

^g Coimbra Chemistry Centre, Faculty of Sciences and Technology, University of Coimbra, Portugal

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ABSTRACT

Background: Acupuncture is one of the most popular and most frequently used complementary medicines worldwide, with benefits for several health conditions when integrated into Western medical practice.

Objective: To perform a retrospective analysis of patient characteristics, health conditions and patient experience in a teaching medical acupuncture appointment at the Faculty of Medicine, University of Coimbra/Coimbra Hospital and University Centre.

Methods: 500 medical records between January 2010 and December 2015 were accessed and 324 were included. The characteristics examined include gender, age, health conditions treated, number of acupuncture needles used in each treatment, professional who referred the patient, type of stimulation, number of treatment sessions and patient experience regarding the degree of improvement at the end of treatment.

Results: Patients range from 13 to 92 years old, with most between 40 and 59 yo (40.7%). In total, 71.3% were female and 28.7% male. The most commonly treated health conditions were musculoskeletal symptoms (60.4%), nervous and headaches (18.2%) and orofacial (11.3%). The median number of appointments was 6 and the median needles used per treatment was 12. In 52.2% of consultations, electrostimulation was performed. The majority of patients were referred by physical and rehabilitative medicine and dentists. 85.3% of patients reported improvement at the end of the treatment, with those who performed more sessions presenting a higher improvement.

Conclusions: This pioneering study in Portugal presents similar results to other countries regarding patient characterization. The high success rate (85.3%) regarding patient improvement recommends the use of acupuncture as an effective complementary therapy.

1. Introduction

Restoring health to the sick is the guiding principle of all medical systems, from the evidence-based medicine approach of Western medicine to the traditional medical systems, such as traditional Chinese medicine. Traditional medicines have been used for centuries in all civilizations for the treatment of a wide range of health conditions and include acupuncture, chiropractic, phytotherapy, homeopathy,

meditation, hypnosis and moxibustion.^{1–3} These therapies are still used today by millions of people both in the geographic area where they originate but also worldwide. For example, traditional Chinese medicine has become very popular in the Western world, with an increase in its use.^{2,4–6} Therefore, we can refer to traditional medicines or therapies as complementary or alternative medicines (CAM) since they can be considered as a complementary therapeutic option in Western medicine.^{2,7,8}

* Corresponding author at: Instituto de Patologia Experimental, Faculdade de Medicina, Pólo III, Azinhaga de Santa Comba, Celas, 3000-548 Coimbra, Portugal.
E-mail address: cmiguel.marto@uc.pt (C.M. Marto).

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This increase in the use of CAM in Western medicine can be attributed to several reasons, like greater dissemination of its practice among physicians and other health professionals, associated with a better understanding of its effects, the inefficacy of some treatments of conventional medicine, as well as adverse effects associated with some pharmacological therapies. In addition, patients' choice for CAM for symptomatic relief, disease control, and to overcome adverse effects or even personal and religious values and the desire for cheaper medical treatments cannot be forgotten.^{3,4,7,9,10} At the same time, patients considered complementary medicines helpful and intend to repeat their use.⁹

From the available CAM, acupuncture is one of the most popular,^{4,7,9,11} being clinically recommended and particularly beneficial for several disorders, namely chronic pain, muscular and osteoarticular disorders and headaches.^{3-5,7,8,12-14}

Contemporary medical acupuncture is an acupuncture approach in which the concepts of traditional Chinese medicine are integrated with the anatomical and physiological concepts of conventional medicine (concepts of neurology, physiology, neuroanatomy...), thus requiring prior medical knowledge and being performed by trained health professionals, namely physicians.^{6,15} After diagnosis, the physician implements a treatment plan, which can include both conventional and complementary therapies. According to the health condition, a single visit or multiple appointments can be needed, and the type of acupuncture can vary from manual puncture without stimulation to puncture associated with heat (moxibustion), electrical stimulation, lasers or magnets. Of these, electrical stimulation is the most commonly used, since it shows faster and longer results in some health conditions such as muscular ones.⁸

For the reasons stated above, acupuncture treatments are increasing in health care services, and we can find an increasing number of physicians who perform or propose these treatments for their patients.^{3,11,16} This way, it is fundamental to expand our knowledge about its efficacy, safety and costs and to validate for which health conditions acupuncture can be useful.¹⁶ Simultaneously, the demographic characterization of the patients who resort to this therapy allows us to identify the population groups in which acupuncture is most used and develop strategies to increase its use among other groups and among referring health professionals.

The aim of this work was to conduct a retrospective descriptive analysis of patient characteristics, health conditions and patient experience treated in the teaching medical acupuncture appointment integrated in the postgraduate studies in medical acupuncture of the Faculty of Medicine of the University of Coimbra in the period between January 2010 and December 2015. Additionally, a comparison with the use of acupuncture in other countries, in particular as regards their therapeutic success, treated health conditions and patient characterization was made.

2. Materials and methods

A randomized selection and subsequent analysis of 500 medical records of patients treated between January 2010 and December 2015 was conducted. Briefly, a random number generator (RANDOM.ORG) was used to randomly generate 500 numbers. Each number corresponds to a numbered medical record inserted in the database, which was used to extract the data. All patients were treated at the medical acupuncture appointment, Faculty of Medicine of the University of Coimbra/Coimbra Hospital and University Centre. This is an outpatient clinic that receives patients referred from all specialties within the hospital and where postgraduate students in the Medical Acupuncture program, from the Faculty of Medicine, University of Coimbra perform observational and practical training. It functions five periods a week in two different locations in the building, the physical and rehabilitative medicine and the dentistry departments. The 5-year period was selected as it provides a significant sample of patients and corresponds to a

period where the medical acupuncture appointment received patients from almost all the specialties within the hospital.

All the selected records included informed consent signed by the patients to use their clinical data for research and teaching purposes (Appendix file A).^{3,16} This study was approved by the Ethics Commission, Faculty of Medicine, University of Coimbra (approval CE-078/2017) (Appendix file B).

From the analysis and information register of the medical records, a database in Excel (Microsoft; Redmond, Washington, USA) with a coding system was created which includes the following characteristics: gender, age, health conditions treated, number of acupuncture needles used in each treatment, professional who referred the patient to the medical acupuncture appointment, type of treatment (manual puncture or electroacupuncture), number of sessions per patient and patient experience regarding degree of improvement obtained at the end of treatments. Some patients performed treatments for more than one health condition in the same consultation, so type of health condition, number of needles used in each treatment, type of acupuncture and degree of improvement were registered separately for each medical condition. Each treatment cycle consisted of four consequent weekly appointments. In each appointment, the degree of improvement after last treatment was registered by questioning the patients. At the end of the fourth appointment a final registration of the patient's improvement was performed, and the necessity to perform more treatments was evaluated. In this work, only the degree of improvement after a treatment cycle (4 appointments) was used for analysis. For patients who performed two or more treatment cycles, the degree of improvement after the final cycle was used.

Despite being a subjective measure, the patients were asked to evaluate their status based on two factors: pain/discomfort/feeling ill and performance of daily activities. Patients were categorized as feeling worse when they reported more pain/discomfort/feeling ill and/or could perform fewer daily activities, indifferent when there were no changes regarding before acupuncture treatments, better when they reported less pain/discomfort/feeling ill and/or could perform more daily activities and much better when they reported no pain/discomfort/feeling ill and could perform all normal daily activities.

The data obtained were subjected to statistical analysis using the IBM Statistical Package for Social Sciences, IBM, version 20. A descriptive analysis of quantitative variables was performed using median and interquartile range and qualitative variables using absolute and relative frequencies.

3. Results

Of the 500 medical records selected, 176 were excluded due to lack of fundamental data that allowed their use in this study, so the remaining 324 were included. Exclusion was applied when 4 or more of the 8 evaluated parameters were missing. For statistical analysis, valid percentages were used. Of these 324 records included, some patients were treated for more than one health condition, thus 346 records were used in analysis referring to the type of health conditions treated, number of needles used and type of treatment. In these cases, the physician registered the above parameters separately for each condition. The degree of improvement was self-reported by the patient and registered by the professional, as previously described.

Socio-demographic data of the study population regarding the number of patients and respective percentages are shown in [Table 1](#).

The characterization of the acupuncture treatments and records included regarding the treated health conditions, number of needles used per treatment, number of visits, type of treatment and patients experience regarding the degree of improvement after the treatment cycle or cycles are shown in [Table 2](#).

The most frequently treated health conditions belong to the group of the musculoskeletal symptoms (60.4%) followed by the nervous system (18.2%) and the orofacial (11.3%).

Regarding patient experience with acupuncture, most patients (85.3%) reported improvement due to medical acupuncture.

Patients who reported improvement (better or much better), performed more appointments and treatment cycles (median of 8 appointments) than those without improvement (median of 3.5 appointments) ($p = 0.006$).

Women report more cases of improvement (88.7%) than men (78.6%), although without statistical differences. Additionally, no differences were found regarding the amount of improvement at the end of treatments by age group, group of the health conditions treated, professional who referred the patient or number of needles used.

Regarding the relation between the type of treatment and the degree of improvement, electrostimulation presents a degree of improvement (better or much better) of 84.4%, while manual puncture without stimulation presented 100% ($p = 0.032$).

The professionals who most frequently referred patients for acupuncture treatments were physical medicine and rehabilitation and dentists with the same frequency (34.8%), as seen in Table 2.

4. Discussion

This study is the first descriptive report of the population at a medical acupuncture teaching appointment in a Portuguese Hospital/Faculty of Medicine. Retrospective studies like this are fundamental sources of patient characterization information and medical records provide valuable data.^{3,16} The random sample allowed us to obtain a representative population of the patients treated at the medical acupuncture appointment between 2010 and 2015.

It was found that women use more complementary therapies, in a proportion which is often 3/1,^{2,3,9} since they are more receptive to these therapies,^{3,17,18} and many of the conditions treated have a higher incidence in females, such as rheumatic fibromyalgia.^{8,13}

Reported ages range from 38 to 52 years,^{4,5,9,12,16,19} but discrepancies can be seen in studies that focus on specific diseases. For example, focus on early incidence health conditions like asthma report a lower median age and when the conditions treated are predominant in more advanced age groups, such as back pain, the median age increases.^{3,11} We do not select any health condition, but musculoskeletal symptoms represent most of the health conditions treated, thus justifying the median age (51 yo) reported.

Muscular disorders like lower back pain and psychological disorders are the main reason why patients use complementary medicine.^{3,4,9} Back pain was not evaluated alone but was included in the musculoskeletal symptoms group, and this was the most treated group, so it is reasonable to believe that similar results will be found if we isolate back pain cases. The high incidence of musculoskeletal diseases among treated patients also explains the large number of consultations in which electrostimulation was used (52.2%), since its beneficial effect

Table 1
Socio-demographic data of the study population.

	Total Frequency (N)	Total Frequency (%)	Valid Frequency (N)	Valid Frequency (%)
Gender	324	100	324	100
Female	231	71.3	231	71.3
Male	93	28.7	93	28.7
Missing	0	0	0	0
Age (years)	324	100	295	100
≤ 39	86	26.5	86	29.2
40-59	120	37	120	40.7
> 60	89	27.5	89	30.2
Missing	29	9	0	0
Median (minimum-maximum)	51 (13 – 92)			

on musculoskeletal and osteoarticular diseases has been proven with results similar to ours.^{5,7,9}

Patient experience regarding the degree of improvement is one important parameter regarding future use, recommendations for other patients and increase in acupuncture use among medical doctors, but most studies did not analyse it, because there is either no record of patient improvement at discharge and among those that do present it, there is a great variability, from 10% to 100%.^{8,9,14} Our information is of particular relevance and is more precise, with 85.3% of patients reporting improvement, of which 9.2% reported feeling much better and only 1.4% reporting feeling worse. These data support the effectiveness of acupuncture as a complementary therapy, due to its beneficial effects and are in line with those reported by Yang et al.¹⁷

Because patients are submitted to treatment cycles, which normally range from 4 (one treatment cycle) to 8 (two treatment cycles) appointments, the median value of 6 seems correct. The highest values found (36 visits) occur because some patients perform several cycles of treatment without interruption (for example, 8 cycles of 4 appointments). Again, different values of appointments per patient were

Table 2
Descriptive analysis of treated health conditions, medical acupuncture appointment and patient experience regarding improvement at the end of treatments.

	Total Frequency (N)	Total Frequency (%)	Valid Frequency (N)	Valid Frequency (%)
Treated health Conditions	346	100	346	100
Musculoskeletal	209	60.4	209	60.4
Nervous and headaches	63	18.2	63	18.2
Orofacial	39	11.3	39	11.3
Sensory	8	2.3	8	2.3
Respiratory	7	2	7	2
Endocrine and metabolism	5	1.4	5	1.4
Other not described	5	1.4	5	1.4
Iatrogenic	4	1.2	4	1.2
Circulatory	3	0.9	3	0.9
Urinary	1	0.3	1	0.3
Skin and aesthetics	1	0.3	1	0.3
Immune, blood and lymphoid tissue	1	0.3	1	0.3
Missing	0	0	0	0
Number of needles used	346	100	297	100
≤ 6	49	14.2	49	16.5
7-12	103	29.8	103	34.7
> 13	145	41.9	145	48.8
Missing	49	14.2	0	0
Median (minimum-maximum)	12 (2-41)			
Number of appointments	324	100	188	100
≤ 6	101	31.2	101	53.7
7-12	67	20.7	67	35.6
> 13	20	6.2	20	10.6
Missing	136	42	0	0
Median (minimum-maximum)	6 (1-36)			
Type of treatment	346	100	113	100
puncture without stimulation	54	15.6	54	47.8
Puncture with Electrostimulation	59	17.1	59	52.2
Missing	233	67.3	0	0
Degree of improvement	324	100	142	100
Worst	2	0.6	2	1.4
Indifferent	19	5.9	19	13.4
Better	108	33.3	108	76.1
Much better	13	4	13	9.2
Missing	182	56.2	0	0
Professional who referred	324	100	23	100

(continued on next page)

Table 2 (continued)

	Total Frequency (N)	Total Frequency (%)	Valid Frequency (N)	Valid Frequency (%)
PMR	8	2.5	8	34.8
DMD	8	2.5	8	34.8
STO	3	0.9	3	13
GFM	2	0.6	2	8.7
MFC	1	0.3	1	4.3
MDX	1	0.3	1	4.3
Missing	301	92.9	0	0

Musculoskeletal: health conditions related to muscular conditions and joint pain (includes lower back pain, neck pain, tendinitis...), except masticatory muscles and neoplasms; **Nervous and headaches:** health conditions of the nervous system and headaches, except neoplasms; **Orofacial:** oral health conditions, temporomandibular joint and masticatory muscles (includes tongue) except neoplasms; **Sensory:** health conditions of the ear, eye, nose and sinuses, except neoplasms; **Respiratory:** health conditions of the respiratory tract, except neoplasms; **Endocrine and metabolism:** health conditions of the endocrine system and metabolism, except neoplasms; **Other not described:** health conditions not included in other group, including neoplasms; **Iatrogenic:** iatrogenic health conditions; **Circulatory:** health conditions of the circulatory system, except neoplasms; **Urinary:** health conditions of the urinary tract except neoplasms; **Skin and aesthetics:** health conditions of the skin and aesthetics, except neoplasms; **Immune, blood and lymphoid tissue:** health conditions of the immune system, blood and lymphoid tissue, except neoplasms. **PMR:** physician specialized in physical and rehabilitation medicine; **DMD:** dentistry doctor; **STO:** physician specialized in stomatology; **GFM:** physician specialized in general and family medicine; **MFC:** physician specialized in maxillofacial surgery; **MDX:** physician which specialty was not recorded.

reported by Herman et al. (3.73 visits/patient), Nik Nabil et al. (3.2 visits/patient) and Yang et al. (3.4 visits/patient); however, comparison is difficult because in those studies patients performed more than one acupuncture treatment in each visit or more than one group of health conditions was treated.^{16,17,20} In Kim et al.'s study, if we look only at output patients (population similar to the present study), the average number of consultations is 6.6, very close to our results.¹² The fact that patients who perform more sessions present a greater improvement in their clinical condition ($p = 0.006$) seems logical since the therapeutic effect is higher with more treatments performed.¹⁰

Importantly, we report a median of 12 needles used in each appointment, but no other studies described this parameter, so we cannot directly compare this with the practice in other countries. A study regarding respiratory disorders reported a median number of 6 points at each treatment, and since the points referred to are bilateral (1 point corresponds to two needles), we can extrapolate 12 needles.¹⁶ Once again, we can presume that the higher recorded values occur because treatments for different health conditions were counted together, increasing the number of needles used.

Among the papers accessed, no specific indication of the healthcare professional who referred the patient is made, with most patients being self-referred or seen in emergency services.^{16,18} Our data is more complete, with physical medicine and rehabilitation physicians and dentists most frequently referring the patient for medical acupuncture, with the same prevalence (34.8%). This fact can be explained by the medical indication of acupuncture in the treatment of these health conditions and helps to explain the high rates of musculoskeletal symptoms and orofacial health conditions treated, as described above. At the same time, as previously described, acupuncture appointments are based in these two departments, so, although acupuncture is still little known by most of the health professionals in Portugal, physicians in these two departments are more aware of its existence and medical indications. Some records do not present an indication of the referring professional, so we assume that the data presented do not include all

the specialties that, in fact, referred patients to the acupuncture appointment.

4.1. Study strength and limitations

Descriptive studies regarding acupuncture use present several disparities due to diseases included, the cohort of patients selected and their enrolment or lack of reported information, among others. Even so, our results are similar to those reported, regarding gender distribution (71.3% female and 28.7% male), median age (51 years old) and health conditions treated. In addition, we report more accurate data of patients' experience regarding degree of improvement at end of treatment and new results about needles used in each appointment and physicians who referred the patients.^{2-4,9,11,12,16,19,21}

As stated, several records lack information which represents the main limitation of these type of studies, since it decreases the number of included records in each parameter.^{4,16} Some analysed parameters were based on a small number of records, like the type of treatment ($N = 113$) and professional who referred the patients ($N = 23$), so we can assume that if a larger number of records were included, results might be different. This way, caution must be made in the extrapolation of these results. This discrepancy can be explained because paper registration performed at appointments allows the absence of filling certain fields, as well as the fact that different professionals perform the consultations, which leads to difficulty in having everyone carry out a detailed completion of all fields.

An important item not addressed in this study was the evaluation of other complementary therapies or standard care treatments by the patients while performing acupuncture. Use of other complementary therapies is usual and can influence the results obtained.³

Also, because this is a single-centre study and in a medical teaching environment, we cannot extrapolate to a national level. Acupuncture in Portugal can be performed by non-physicians and in a non-hospital environment, so results would probably be different if we included other practitioners and locations.

However, it should be reinforced that, to our knowledge, this is the first study of its kind in Portugal, presenting data from a teaching medical acupuncture appointment and performing patient characterization.

Future perspectives include recording the data of all patients in the period comprised, which will allow a considerable increase in sample size and a more detailed patient characterization, bringing it closer to the studies with the greatest number of patients.^{4,5,19} Directing the study at a group of specific health conditions may also be considered, allowing new results in specific groups to be obtained. Despite this, it contributes to increasing our knowledge of the population who attend acupuncture treatments and its effects, as well as its dissemination among health professionals,⁹ of greater importance at a time when medical acupuncture is already a recognized medical competence and is taught in postgraduate studies in four of the Portuguese medical schools. It also highlights the important assistance role of the medical acupuncture courses of the Faculty of Medicine of the University of Coimbra, which, in addition to the teaching function, perform a unique medical activity in Portugal with a high number of medical consultations and treatments performed.

5. Conclusion

Despite its being the first study of this kind in Portugal, our results show a similar patient profile to others worldwide, with middle-aged females with musculoskeletal symptoms, nervous and orofacial health conditions attending medical acupuncture treatments most often.

Clinically, the medical acupuncture consultation has shown a high adherence both by patients and by health professionals. Acupuncture is beneficial in most cases, with patients reporting an improvement or

complete resolution in a very high number of cases. Besides patient satisfaction, reduction or elimination of pharmacological therapies and the reduced cost of these treatments make them of great interest in healthcare services.

Finally, the enormous amount of information collected at medical acupuncture consultations presents great potential for future studies.

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Participants' consent

Obtained. All signed an informed consent form.

Declaration of Competing Interest

None.

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Appendices A and B. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.ctim.2019.102227>.

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