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# Wissenschaft und Forschung

## Tagungsbeiträge

### Abstracts der Poster der Jahreskonferenz der Medizinischen Sektion am Goetheanum, 15.–17.9.2023, Dornach (Teil 2)

#### 1 | Clinical effectivity of the anthroposophic medicine: a CABSIN evidence map

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**Background and question:** Anthroposophic Medicine (AM) uses mineral, vegetable and animal medicines characterized as anthroposophic dynamized drugs by the Brazilian Health Regulatory Agency (ANVISA), in addition to therapies such as eurythmy therapy, rhythmical massage therapy, biographical counselling, psychotherapy, art therapy, and others. Since 2006, AM is one of the integrative and complementary health practices included in the Unified Health System (SUS) in Brazil through the National Policy of Integrative and Complementary Practices (PNPIC) which calls it anthroposophy applied to health due to its multidisciplinary nature. In this context, the study presents an evi-

dence map of the clinical effectiveness of anthroposophic medicine.

**Materials and methods:** The study was based on the Evidence Gap Map methodology, adapted by BIREME/PAHO/WHO, which consists of graphically representing the characteristics and findings of the evidence in review studies associating interventions with the outcomes analyzed, in addition to link with the reported effects of the interventions, with the population and focus country of the primary studies included in the reviews. The outcomes considered were: well-being and quality of life, health care, cancer, other pathological conditions, physiological and metabolic indicators. On the map, associations are represented using bubbles of different colors that represent the effect (positive, potentially positive, or inconclusive) and the confidence level (high, moderate, low or critically low) of the association, based on AMSTAR2. The bubble size is equivalent to the number of studies that analyzed the association. The 33 review studies eligible for inclusion in the Evidence Map were: systematic, with or without meta-analysis, scoping and similar, which could answer the following research question: What is the effectiveness of anthroposophic medicine for health outcomes?

**Results:** From the 33 studies evaluated, the main positive findings of each outcome were: well-being and quality of life: *Viscum album* has been associated to the improvement of the life quality in 85% of studies; healthcare: the same medicine has been reported as safe to patients in 73.3% of cases, having the multimodal therapy a positive outcome in 60 % of cases. The

action of *Viscum album* in cancer has been considered positive, and potentially positive in 22.2% and 48.1% of cases, respectively, being its action on survival, radiotherapy and chemotherapy effects the main findings. *Viscum album* and other anthroposophic medicines are also frequently associated with improvement of the metabolic markers in 66% of the patients, especially considering immunological biomarkers, and cardio-respiratory coordination. Other conditions also mentioned include respiratory infections and gastrointestinal disorders, for which the anthroposophic medicines and therapies have shown a positive outcome in 50% of cases.

**Discussion and conclusion:** Until now, there are few scientific reports about the effects of anthroposophic medicines in patients presenting different conditions. From all anthroposophic medicines, *Viscum album* has been the most studied nowadays. However, from the studies reported, it was found a positive or potentially positive outcome for most of the patients. The anthroposophic therapies associated with medicines have provided better outcomes for the patients.

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## 2 | Assessing how an herbal multicomponent medicine for digestive disorders interacts with the growth of selected intestinal bacteria

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**Background:** The multi-component herbal medicine Amara oral drops consists of nine different hydroethanolic herbal extracts, *Artemisia absinthium* (Aa), *Centaureum erythraea* (Ce), *Cichorium intybus* (Ci), *Gentiana lutea* (Gl), *Juniperus communis* (Jc), *Millefolii herba* (Mh), *Peucedanum ostruthium* (Po), *Salvia officinalis* (So) and *Taraxacum* (T). It is indicated for treatment of moderate digestive disorders like fullness, heartburn, nausea and disturbed gastrointestinal motility. A well-functioning digestion is inevitably linked to a healthy intestinal microbiota. Thus, medication should not interfere with intestinal microbes. We aimed to evaluate the antibacterial impact of the herbal extracts towards distinct bacterial strains using an in vitro approach. **Material and methods:** Dry extracts were prepared from mother tinctures of extracts used for production of the final medicinal product Amara oral drops (Amara-Tropfen). Cloves, a known antibacterial spice, was used as herbal reference compound. Bacterial strains were incubated in liquid culture under constant shaking at 37°C for up to 7 h together with test samples or controls.

**Results:** No extract contained in Amara revealed antibacterial effects towards the intestinal commensal bacterial strain *Escherichia coli* up to a concentration of 10 mg/ml. The growth of *Enterobacter cloacae* and *Bacillus subtilis* was differentially affected by some extracts at higher concentrations. The reference extract from cloves was strongly antibiotic towards all tested bacterial strains.

**Conclusion:** These results indicate that Amara oral drops are predominantly

compatible with the intestinal bacterial strains *E. coli* and *E. cloacae* and might be considered as microbiome-friendly. Additional studies are required to further characterise the compatibility of Amara oral drops with intestinal microbiota.

## 3 | Systematische Untersuchung von Kombinationen pflanzlicher und mineralischer Tiefpotenzen anhand der Tropfenverdunstungsmethode

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**Hintergründe und Ziele:** In vergangenen Studien ist die Tropfenverdunstungsmethode bereits genutzt worden, um die Musterbildung von Tiefpotenzen verschiedener Ausgangssubstanzen in verschiedenen Potenzhöhen sowie den Einfluss der Schüttelschläge bei der Herstellung zu studieren. In der vorzustellenden Studie wurde nun der methodische Ansatz genutzt, um gezielt Kombinationen von jeweils einer pflanzlichen sowie einer mineralischen Ausgangssubstanz in den Potenzhöhen D2 oder D3 zu untersuchen, mit dem Ziel, Aufschluss über die Wirkung der jeweiligen Bestandteile auf die Musterbildung zu gewinnen.

**Material und Methoden:** In dieser Studie wurden Urtinkturen von *Baptisia*, *Cimicifuga*, *Cypripedium*, *Echinacea*, *Equisetum*, *Passiflora*, *Urtica* sowie die Salze Kupferchlorid, Kupfersulfat, Kaliumnitrat, Natriumsulfat und Natriumchlorid verwendet. Jeweils eine der sieben pflanzlichen Arzneimittel wurde hierfür mit jeweils einem der fünf Salze (beide entweder in D2 oder D3) im Verhältnis 1/1 kombiniert. Von den Einzelsubstanzen als auch allen

Kombinationen wurden jeweils ca. 28 Tropfen auf Glasobjektträgern unter standardisierten Bedingungen in einem Wärmeschrank zum Verdunstungsgebräch und anhand von Dunkel-feldmikroskopie in 25- sowie in 100-facher Vergrößerung fotografiert. Die Bilder wurden qualitativ ausgewertet und mittels der Software ImageJ quantitativ analysiert. Für die quantitative Auswertung wurden die Texturparameter *Entropy* und *Contrast* sowie die Formparameter *Circularity* und *Solidity* verwendet.

**Ergebnisse:** Generell bilden D2-Potenzen mehr Strukturen aus als D3-Potenzen. Die Kombinationen von Pflanzen- und Salzpotenzen bilden deutlich stärkere Strukturen aus als die jeweiligen Einzelbestandteile. Die Zugabe von Salzpotenzen (besonders bei KNO<sub>3</sub>, NaCl, and CuCl<sub>2</sub>) erhöht die Differenzierfähigkeit der pflanzlichen Potenzen. Qualitativ betrachtet zeigen die Kombinationen neue Musterformen, die von den jeweiligen Einzelpotenzen deutlich unterschieden werden können.

**Diskussion und Ausblick:** Durch diese Pilotstudie konnte gezeigt werden, dass die Tropfenverdunstungsmethode gut geeignet ist, um mehr Informationen über die spezifischen Eigenschaften von Kombinationsarzneimitteln zu erhalten. Für die bessere Charakterisierung von pflanzlichen Potenzen sollten im Sinne der Weiterentwicklung der Methode in Folgestudien andere Mischungsverhältnisse mit additiven Salzen systematisch untersucht sowie generell das Potenzial der Methode für die homöopathische Grundlagenforschung weiter genutzt und ausgebaut werden.

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#### 4 | Topical use of *Viscum album* hydrogel in rheumatoid arthritis: a case report

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**Clinical case:** We present a case of an 85-year-old female diagnosed with rheumatoid arthritis since the age of 40. The patient had complaints regarding her knees, wrists, proximal joints of hands, shoulders and feet. She also presented deformations in her hands and restriction in movements. She was taking anthroposophic medicines, fermented *Viscum album* and following eurythmy therapy for 21 years. These treatments improved her inflammatory process to a great extent and she was able to walk autonomously. After several biographic episodes, especially due to the COVID-19 pandemic that was accompanied with isolation, depression, fear of re-infection, financial issues, besides other aspects, her case worsened. These psychological factors combined with irregularities in drug therapy and interruption of therapeutic eurythmy lead to an increase in the pain. With symptoms of articular pain, she started using a wheel chair and walking with support and help. It was during this period that she began using a transdermal biocompatible hydrogel containing *Viscum album* (*ssp abietis*), which was prepared using a dry extract (1,2). A thin layer of the hydrogel is applied 15 minutes in advance from every time the patient is standing up

and wants to walk. Its therapeutic benefits worked “from the outside to the inside” relieving the intensity of pain, thus allowing her to move for short distances and allows significant reduction in pain during restricted time. She re-started applying the injectable fermented *Viscum album* from *Malus domestica* in association to the dermal hydrogel, which furthermore improved her mobility and prolonged the lasting period without pain.

**Conclusion:** This is the first case demonstrating the topical therapeutic potential of *Viscum album* hydrogel in rheumatoid Arthritis.

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#### 5 | Kann Hahnemanns Konzept einer geistartigen Wirkung potenziertes Substanzen Bestandteil der heutigen wissenschaftlichen Diskussion sein?

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**Hintergrund und Frage:** Heutige Wissenschaftler haben keine allgemein anerkannte Theorie zum Wirkprinzip potenziertes Substanzen, insbesondere von Hochpotenzen. Hahnemann hatte allerdings eine klare Vorstellung in dieser Hinsicht; er nannte die Wirkung geistartig. Der Begriff geistartig ist in wissenschaftlichen Diskussionen unüblich. Angesichts der nach wie vor offenen Frage zu einem zentralen Konzept der Homöopathie sind wir den folgenden Forschungsfragen nach-

gegangen: Kann Hahnemanns Begriff einer geistartigen Wirkung in einer Weise verstanden werden, die für eine heutige wissenschaftliche Forschung geeignet ist? Beinhaltet Hahnemanns Konzept einer geistartigen Wirkung hilfreiche Aspekte, die bisher in der Homöopathieforschung vernachlässigt wurden?

**Material und Methoden:** Mit Hilfe der Bibliothek des Instituts für Geschichte der Medizin (Stuttgart) wurde das gesamte gedruckte Werk Hahnemanns im Hinblick auf die Verwendung des Begriffs geistartig untersucht. Von 286 Dokumenten wurden 76 als thematisch relevant selektiert. Darin wurden Textpassagen mit der Wortwurzel geist\* inhaltlich und im thematischen Zusammenhang analysiert. Hahnemanns Verwendung der Wurzel geist\* im Verlauf der Entwicklung der Homöopathie, die empirische und theoretische Grundlage für seine Verwendung des Begriffs geistartig, wurde herausgearbeitet und eine wissenschaftshistorische Einordnung von Hahnemanns Begriffsbildung vorgenommen.

**Ergebnisse:** Hahnemann hat den Begriff geistartig erst 1833 eingeführt, nach jahrzehntelanger Forschung zur Wirkung homöopathischer Arzneien. Demnach ist die geistartige Wirkung wie folgt charakterisierbar:

- Eine Wirkung ohne Übertragung von Materie (dynamisch, vergleichbar einer physikalischen Kraft).
- Eine Wirkung, welche physiologische Prozesse in Organismen in qualitativer Weise (re)organisiert, spezifisch für jede Substanz. Das Spezifische der Wirkung wird durch Potenzieren gefördert.
- Die Wirkung ist verschieden von physikalischen Kräften, sie tritt nur in lebendigen Organismen auf.

Hahnemann hat seine Aussagen begründet mit empirischen Beobachtungen, insbesondere mit dokumentierten Berichten von Arzneimittelprüfungen. Er verstand den Begriff einer geistartigen Kraft als eine „an der Beobachtung gebildete abstrakte Idee“. Demnach kann Hahnemanns Konzept einer geistartigen Kraft angesehen werden als eine regulative Vernunftidee im Sinne Kants, die dieser insbesondere für Forschungen auf dem

Gebiet des Lebendigen eingeführt hatte.

**Diskussion und Schlussfolgerung:** Hahnemanns Begriff eines geistartigen Wirkprinzips potenziertes Arzneien ist eindeutig bestimmt sowie empirisch und erkenntnistheoretisch begründet. Er erscheint demnach als geeignet für die wissenschaftliche Verwendung. Der Begriff geistartig beinhaltet eine organisierende Wirkung auf lebende Organismen, zusammen mit der Eigenschaft, dass die geistartige Arzneiwirkung verschieden ist von physikalischen Wirkungen. Diese Charakteristika können empirisch überprüft werden. Insofern bilden Hahnemanns Auffassungen eine fruchtbare Inspiration für die zukünftige Forschung.

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## 6 | The underlying molecular mechanisms of two herbal compound mixtures in sleep-related disorders

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**Background:** A good night's sleep is essential for our overall health and well-being. Lack of sleep can have a negative impact on our physical, emotional and cognitive functioning. There are several phytotherapeutic preparations available to improve sleep's quality. Calmedoron® and Ansiodoron® preparations are traditionally used to aid sleeping disorders promoting soothing sleep. Calmedoron® contains an herbal mixture preparation of four hydroethanolic herbal extracts (*Avena sativa* (As), *Humulus lupulus* (Hu), *Passiflora incarnata* (Pn) and *Valeriana officinalis* (Vo)) whereas Ansiodoron® contains only three (As, Vo and *Passiflora alata* (Pa)). The study goal is to

understand the molecular mechanisms of both herbal mixture preparations and its single extracts to improve sleep quality and promote sleeping.

**Material and methods:** We investigated the functional activity of several G protein-coupled receptors known to play a role in sleep regulation: adenosine A<sub>1</sub> and A<sub>2</sub>, GABA<sub>B1a-B2</sub> and prostaglandin D<sub>2-1</sub> (DP<sub>1</sub>) receptors, using a cell-based cAMP assay. The dry extracts were prepared from the commercial medicinal products or from the ethanolic tinctures.

**Results:** Both herbal mixtures potentially promoted the activity of A<sub>1</sub> and GABA<sub>B1a-B2</sub> receptors but only Calmedoron® herbal mixture extract activated A<sub>2</sub> receptor, shown by intracellular cAMP release (IC<sub>50</sub> < 300 µg/ml). However, DP<sub>1</sub> receptor's activity was not affected. Single extracts triggered different receptors' activity: Pn and Vo inhibited A<sub>2</sub> and GABA<sub>B1a-B2</sub>; Vo also inhibited A<sub>1</sub>; As, Hu and Pa induced GABA<sub>B1a-B2</sub> activity (IC<sub>50</sub> < 180 µg/ml).

**Conclusion:** These data suggest that both herbal mixture extracts trigger distinct sleep receptors. Additionally, each individual extract's activity profile could complement each other, potentially resulting in a greater overall preparation's efficacy.

## 7 | In vitro studies highlight the potent anti-inflammatory capabilities of the hydroethanolic Arnicae flos extract

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**Background:** Traditionally *Arnica montana* L. is indicated for treatment of blunt injuries like strains and bruises that are physiologically accompanied by local inflammation, including activation of the NF-κB pathway and release of pro-inflammatory mediators such as leukotrienes and prostaglandins. Here we aimed to evaluate the anti-inflammatory efficacy of a hydroethanolic extract from Arnicae flos (A. flos).

**Material and methods:** The dry extract from A. flos was prepared using liquid extracts from fresh flowers. NF-κB ac-

tivation was analysed in a reporter assay with the human Jurkat cell line. Stimulated human PMNLs or monocytes were used for analysis of 5-lipoxygenase (5-LO) product formation and cyclooxygenase2 (COX-2)-mediated PGE<sub>2</sub> release. 5-LO and COX-2 gene expression was analysed in the human THP-1 cell line, stimulated with LPS.

**Results:** A. flos concentration-dependently inhibited NF-κB activation (IC<sub>50</sub>: 52.5 µg/ml), and PGE<sub>2</sub> release from monocytes (IC<sub>50</sub>: 105.4 µg/ml). In contrast, 5-lipoxygenase product formation in PMNLs was not inhibited by A. flos (IC<sub>50</sub>: > 300 µg/ml). In a cell-free enzyme inhibition assay, A. flos concentration-dependently inhibited both, 5-LO and COX-2 enzyme activity (IC<sub>50</sub>: 47.8 µg/ml and 33.1 µg/ml). In addition, A. flos significantly inhibited 5-LO gene expression in a concentration-dependent manner.

**Conclusion:** In this experimental in vitro approach the complex mixture of active compounds contained in the Weleda A. flos extract demonstrated potent anti-inflammatory and pain-related activity. Additional studies are performed to further characterise therapeutic advantages of A. flos preparations.

## 8 | Potential molecular mechanism of *Bryophyllum pinnatum* preparations in the management of various hyperactive disorders

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**Background:** *Bryophyllum pinnatum* (BP, aka Kalanchoe pinnata) is a succulent plant native to Madagascar. Preparations from its leaves are traditionally used especially in complementary medicine for a variety of hyperactive conditions such as restlessness, anxiety, attention deficit hyperactivity disorder (ADHD), preterm labor, hyperactive bladder, restless leg syndrome, and especially sleep disorders. GABA (gamma-aminobutyric acid) is a central inhibitory neurotransmitter in the mature mammalian central nervous system (CNS)



and its principal role is reducing neuronal excitability. It inhibits CNS functions and reduces the body's muscle tone by binding and activating either the ionotropic GABA<sub>A</sub> receptor or the G protein-coupled GABA<sub>B</sub> receptor, respectively. Here we tested the ability of BP preparations either to act on GABA receptors or to interfere with other G protein-coupled receptors known to play a role in the sleep-wake/activity regulation, i.e. adenosine A<sub>1</sub> and A<sub>2</sub> and prostaglandin D<sub>2</sub>-1 (DP<sub>1</sub>) receptors.

**Material and methods:** The dry extracts were prepared directly from leaves (BP<sub>L</sub>) or from hydroethanolic leaf extract (BP<sub>EtOH</sub>). In this study, CHO cells stably transfected with GABA-activated channels of the GABA<sub>A</sub> subtype were used together with submaximal GABA concentrations to investigate the modulatory effects of extracts. To investigate the activation of A<sub>1</sub> and A<sub>2</sub>, GABA<sub>B1a-B2</sub> and DP<sub>1</sub> receptors, a cell-based cAMP assay was used.

**Results:** Investigations by patch clamp revealed that the extracts BP<sub>L</sub> as well as BP<sub>EtOH</sub> strongly activated GABA<sub>A</sub> in a concentration-dependent manner. Notably, the activation triggered by BP<sub>EtOH</sub> was significantly stronger as compared to BP<sub>L</sub>. Similar results were obtained for the GABA<sub>B</sub> receptor with IC<sub>50</sub> values of 11.5 µg/ml for BP<sub>EtOH</sub> and 30.2 µg/ml for BP<sub>L</sub>, respectively. All other receptors investigated were not affected by any of the BP preparations.

**Conclusion:** These data suggest that BP is a beneficial treatment in a variety of hyperactive conditions due to its capability to activate GABA receptors.

## 9 | Mechanisms of action of an herbal mixture preparation to enhance gastric accommodation in patients with functional dyspepsia

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**Background:** In functional dyspepsia, impaired gastric accommodation has been found in a significant proportion of cases, however, the underlying cause of this disorder is poorly understood. Amara oral drops is traditionally

used for treatment of gastrointestinal dysmotility and contains an herbal mixture of nine hydroethanolic herbal extracts (*Artemisia absinthium*, *Centaureum erythraea*, *Cichorium intybus*, *Gentiana lutea*, *Juniperus communis*, *Millefolii herba*, *Peucedanum ostruthium*, *Salvia officinalis* and *Taraxacum*). The study aim was to investigate the herbal mixture's mechanisms to improve gastrointestinal motility disorders such as gastric accommodation by identifying the specific targets.

**Material and methods:** We investigated the functional activity of several G-protein-coupled-receptors known to play a role in the pathogenesis of gastrointestinal disorders, i.e. muscarinic M<sub>3</sub> and M<sub>2</sub>, opioid µ (OP<sub>1</sub>) and several serotonin receptors (5-HT<sub>1B</sub>, 5-HT<sub>1D</sub>, 5-HT<sub>3</sub>, 5-HT<sub>7</sub> and 5-HT<sub>1A</sub>). The dry extracts were prepared from the commercial medicinal product Amara oral drops or from the ethanolic tinctures.

**Results:** The herbal mixture potentially impaired the activity of OP<sub>1</sub> and M<sub>2</sub> receptors, shown by inhibition of intracellular cAMP release (IC<sub>50</sub>: 304 & 219 µg/ml, respectively). Furthermore, *Juniperus*, *Salvia* and *Peucedanum* extracts impaired M<sub>2</sub> receptors' activity (IC<sub>50</sub>: 32, 20.1 & 20.8 µg/ml, respectively), whereas *Gentiana*, *Artemisia*, *Cichorium* and *Juniperus* inhibited OP<sub>1</sub> receptors' activity (IC<sub>50</sub>: 41.7, 21.7, 104 & 24.6 µg/ml, respectively). However, serotonin and M<sub>3</sub> receptors' activity was not affected.

**Conclusion:** These data suggest that the Amara herbal extract has an effect on central motility-regulating receptors involved in gastrointestinal disorders. Additionally, different activity profiles of the individual extracts act together, resulting in an increase of the overall preparation's efficacy.

## 10 | Holistic movement therapy in allergic rhinitis: A 45-year-old female treated with eurythmy therapy sequence TSRMA

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**Question:** According to self-assessment, allergic rhinitis is the most common allergy in Germany with 30.9% (1). Those affected, women more than men, complain of itching in the nose, eyes and throat, sneezing, rhinorrhea, swollen and watery eyes, but also headaches or breathing difficulties. Antihistamines, glucocorticoids and chromones are used to relieve symptoms. Affected people seek alternatives out of concern for possible side effects. Eurythmy therapy (EYT) offers the exercise sequence TSRMA, which was first used to treat a 50-year-old hay fever patient in 1921 (2). The individual components of the sequence train self-assertion against external influences (3), calming, inner security, mastery, breathing regulation (4), integration of foreign substances (3) and resistance (4). EYT is a self-activating holistic movement therapy. The exercises are usually free of side effects.

**Material and methods:** A 45-year-old female came to the practice with hay fever symptoms in early March 2021. She had been suffering from hay fever since the age of 17. She refrained from outdoor activities whenever possible in the spring because of the severe symptoms. The exercise sequence TSRMA was introduced immediately, with jumps performing the sounds T and S. The R was done with a knee bend, the M as a deep pendulum movement. The sound A was introduced as a movement meditation "accepting" and thus as part of the series, but also practiced additionally in the evening before going to bed. The patient received 6 interventions with small breaks until the end of July 2021. The patient practiced daily until September and prophylactically resumed the exercises in January 2022 as proposed by the therapist.

**Results:** Already after the 1st intervention, there was an improvement of the symptoms; after 4 months, there were neither watery eyes nor rhinorrhea. When contacted in March 2022, the patient reported that she can now spend time outdoors even during the main pollen season without any problems.

**Conclusion:** Data collected between 2012 and 2015 on the treatment of allergic rhinitis with the TSRMA exercise

sequence show similar results: Subjects reported a decrease in symptoms and an improvement in quality of life (5). The same is true for the historical case (6). This suggests a wider application of the exercise sequence. More in-depth research into its effectiveness is desirable to find out whether TSRMA only relieves symptoms or else might have an overall curative effect.

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