

# A Cross-sectional Survey on Dentist's Knowledge and Perception towards the Application of Arnica Montana in Dental Practice

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## ABSTRACT

**Introduction:** Postsurgical oedema (PSE) is a common complication encountered in the dental field following different surgical procedures including wisdom teeth extraction and other periodontal and implant surgeries. Arnica Montana (AM) is a homeopathic agent which may represent as a safe, effective and an alternative agent for Non Steroidal Anti-Inflammatory (NSAID) medications to prevent or decrease the risk of PSE.

**Aim:** To evaluate the knowledge of practicing dentists and their experiences using AM supplements in their daily practice for management of PSE.

**Materials and Methods:** This was an observational, cross-sectional self reported electronic based study to survey practicing dentists on the application of AM in daily dental practice conducted from January to September 2021. The electronic survey included 13 questions on: 1) dentist's demographics and educational backgrounds; 2) knowledge related to AM supplement; and 3) previous experience, if any, with AM use for management of PSE. The survey was distributed to potential subjects and descriptive statistics was used to summarise the

data, and presented as percentages and frequencies using Microsoft Excel for mac (Version 16.40).

**Results:** A total of 84 subjects participated in the survey, out of which 23 (27.3%) were familiar with AM use in dentistry. Overall, 15 participants (65.2%) indicated preventions or reduction of PSE risk and pain and seven participants reported prevention and reduction of postsurgical discolouration and bleeding (30.4%) as potential indications for AM use. In total, eight participants (34.7%) have prescribed AM to patients before, mainly for external and internal sinus grafting (4/8; 50% for both) and surgical extraction of impacted teeth (2/8; 25%). Out of all, five participants (5/8; 62.5%) reported significant benefit with using AM following a surgical procedure and four participants (50%) reported numbness of the lips, altered taste sensation and increased bleeding as associated toxicities.

**Conclusion:** From the present study the uses and user based experienced of the material AM in the field of dentistry can be well understood and analysed. This was the first survey to discuss the knowledge and application of AM among dentists from various specialties.

**Keywords:** Dentistry, Homeopathy, Postsurgical oedema

## INTRODUCTION

A common complication encountered in the field of dentistry is PSE, following different surgical procedures such as wisdom teeth extraction and other periodontal and implant surgeries [1]. The degree and severity of PSE are influenced by several factors such as the complexity of the surgical procedure, patient's medical condition, age and gender, in addition to practitioner's clinical experience [1]. Traditionally, the use of anti-inflammatory medications such as ibuprofen and corticosteroids to manage PSE has been a common and an effective practice in the medical field [2-5]. However, potential organ toxicities should always be considered. As a result, other pharmacological options should be considered including AM [6].

Homeopathic remedy for management of pain, swelling and other inflammatory conditions has been a common practice for centuries [7]. The AM is a homeopathic supplement which may represent a safe, effective and an alternative agent for NSAID [8]. It is an extract from different plant species belonging to the Asteraceae family including AM, Arnica Chamissonis and Arnica Fulgens and can be found in Central Europe and the Siberian mountains [9]. Cumulative, emerging evidence suggests that the common practice of prescribing NSAIDs to manage Postsurgical Sequela (PSS) of oedema, pain and ecchymosis can be replaced with AM with less anticipated toxicities [7]. As of today, the exact mechanism of AM has not been elucidated; however, it is believed to inhibit histamine release from mast cells, promote secretion of serotonin from platelets and thromboxane

B2 formation [10]. Available literature has demonstrated superior outcome of AM when compared to placebo in the management of PSS [11-13]. Overall, AM is considered safe for human consumption as reports demonstrated Asteracea containing cures were often times utilised as part of german essential care, and their uses were not related to toxic responses [6,8,14,15]. Potential side-effects are mild and include itching, stomach pain and diarrhoea [16].

As of today, no literature is available on the dentist's perception and knowledge toward AM supplements and its application in among dentists from various specialties. The aim of this study was to survey practicing dentists for their experience with using AM supplements in their daily practice.

## MATERIALS AND METHODS

This was an observational, cross-sectional self-reported electronic-based study to survey the knowledge and perception of a convenient sample of practicing dentists (general practitioners and specialists in private and governmental sectors) on the application of AM in daily dental practice. The study was conducted from January to September 2021. A Human Research Ethical approval No. 045-05-20 was obtained through King Abdulaziz Univeristy, Faculty of Dentistry, Jeddah, Saudi Arabia.

**Inclusion criteria:** All practising dentists (general practitioners and specialists in private and governmental sectors) willing to participate in the study were included.

**Exclusion criteria:** Exclusion criteria retired dentists; non English speaking subjects; and subjects who were not willing to participate or complete the study were excluded.

**Study Procedure**

The electronic survey was administered in English language and created in Qualtrics® (Drive Provo, UT, USA) [17]. It included a total of 13, close-ended questions divided over three sections on 1) dentist’s demographics and educational backgrounds; 2) knowledge related to AM supplement; and 3) previous clinical experience, if any, with AM in managing dental patients. It was estimated for the survey to take three to seven minutes to answer all questions. Prior to survey distribution, validation of included questions was completed by field experts and pilot tested through enrollment of 10 dentists and collection of comments and suggestions with Cronbach’s alpha value of 0.8. Minor modifications of four questions in terms of language and style were completed based on provided feedback.

Consent was obtained from all subjects prior to participation in the study. The survey link was distributed to potential subjects through several portals including national dental societies, social media portals (i.e., Twitter®, Instagram®, WhatsApp®, Facebook®) incorporating paid advertisement as well as personal communications. Follow-up message was sent after two and four weeks respectively, after the initial distribution to encourage subject participations.

**STATISTICAL ANALYSIS**

Collected raw data were saved securely in a password protected and encrypted server. Descriptive statistics was used to summarise the data, and presented as percentages and frequencies using Microsoft excel for mac (Version 16.40).

**RESULTS**

A total of 84 subjects participated in the survey and responded to all questions. There were 44 males and 40 females, most of the study participants had master’s degree (33/84; 39.2%) or PhD/Doctorate degree (24/84; 28.5%). Most dentists were oral medicine specialists (25/84; 29.7%), followed by general dentists (20/84; 23.8%) and oral surgeons (8/84; 9.5%). Demographics details of study participants are listed in [Table/Fig-1].

**Knowledge and experience with AM:** Out of all participants, 23 (27.3%) were familiar with AM use in the dental field [Table/Fig-2]. In this subgroup, there were 16 males with age 25 years or above and most participants were holders of PhD/Doctorate degree (12/23; 52%),

Demographic variables		Frequency (n=84)	Percentage (%)
Age (years)	25-34	23	27.3%
	35-45	49	58.3%
	46-55	10	11.9%
	>55	2	2.3%
	Gender	Male	44
	Female	40	47.6%
Highest educational degree	Not specified	11	13.0%
	Bachelor	7	8.3%
	Diploma	3	3.5%
	Board certification	6	7.1%
	Masters	33	39.2%
	Doctorate/PhD	24	28.5%
Work experience (years)	0-4	17	20.2%
	5-9	23	27.3%
	10-14	14	16.6%
	15-19	16	19.0%
	20-24	8	9.5%
	>25	6	7.1%

Specialty	General dentistry	20	23.8%
	Restorative/operative dentistry	5	5.9%
	Prosthodontics	6	7.1%
	Endodontics	5	5.9%
	Orthodontics	1	1.1%
	Periodontics	13	15.4%
	Oral medicine	25	29.7%
	Oral surgery	8	9.5%
	Dental public health	1	1.1%
Country	Egypt	3	3.5%
	India	1	1.1%
	Israel	1	1.1%
	Senegal	1	1.1%
	Saudi Arabia	64	76.1%
	UAE	1	1.1%
	USA	13	15.4%

**[Table/Fig-1]:** Demographics of all study participants. UAE: United Arab Emirates; USA: United States of America

followed by Master’s degree (10/23; 43.4%) and had a work experience ranging from 0 to >25 years. There were nine periodontists (39.1%), six oral medicine specialists (26%), four oral surgeons (17.3%), two prosthodontists (8.6%) and a single participant from each, endodontics and dental public health (4.3%).

Demographic variables		Frequency (n=23)	Percentage (%)
Age (years)	25-34	3	13.0%
	35-45	14	60.8%
	46-55	4	17.3%
	>55	2	8.6%
Gender	Male	16	69.5%
	Female	7	30.4%
Highest educational degree	Not specified	1	4.3%
	Masters	10	43.4%
	Doctorate/PhD	12	52.1%
Work experience (years)	0-4	1	4.3%
	5-9	9	39.1%
	10-14	3	13.0%
	15-19	6	26.0%
	>25	4	17.3%
Specialty	Prosthodontics	2	8.6%
	Endodontics	1	4.3%
	Periodontics	9	39.1%
	Oral medicine	6	26.0%
	Oral surgery	4	17.3%
	Dental public health	1	4.3%
Country	India	1	4.3%
	Israel	1	4.3%
	Senegal	1	4.3%
	Saudi Arabia	15	65.2%
	USA	5	21.7%

**[Table/Fig-2]:** Demographics of participants who were familiar with AM.

All 23 participants were asked several questions related to AM application in the dental field [Table/Fig-3]. When asked about AM proposed benefits, 15 participants (65.2%) indicated preventions or reduction of PSE and pain and seven participants reported prevention and reduction of postsurgical discoloration and bleeding (30.4%). In terms of indications for AM use in the dental field, 19 participants (82.6%) reported surgical extraction of impacted teeth, followed by bone and soft tissue grafting procedures (10/23; 43.4% for both).

Question	Response	Frequency n (%)
What is AM's proposed action/effect? Select all that applies	To prevent or reduce postsurgical oedema	15 (65.2%)
	To prevent or reduce postsurgical pain	15 (65%)
	To prevent or reduce postsurgical discoloration	7 (30.4%)
	To prevent or reduce postsurgical bleeding	7 (30.4%)
In the dental field, please select procedures where AM can be used? Select all that applies	External sinus lift	7 (30.4%)
	Internal sinus lift	6 (26.0%)
	Surgical extraction of impacted teeth	19 (82.6%)
	Bone grafting procedures	10 (43.4%)
	Soft tissue grafting procedures	10 (43.4%)
	Crown lengthening procedures	9 (39.1%)
	Botox injections	7 (30.4%)
	Filler injections	6 (26.0%)
Have you ever advised Arnica AM for your patients as a part of a dental procedure?	No	15 (65.2%)
	Yes	8 (34.7%)
What was the procedure? Select all that applies	External sinus lift	4 (50%)
	Internal sinus lift	4 (50%)
	Surgical extraction of impacted teeth	2 (25%)
	Bone grafting procedures	0
	Soft tissue grafting procedures	0
	Crown lengthening procedures	0
	Botox injections	0
	Filler injections	0
Did you notice any benefit?	Major benefit	5 (62.5%)
	Minimal benefit	2 (25%)
	No benefit	1 (12.5%)
Did you notice any side-effects?	No	4 (50%)
	Yes	4 (50%)
Reported side-effects (Select all that applies)	Hypersalivation	1 (12.5%)
	Parathesia of the lips	2 (25%)
	Altered taste sensation	2 (25%)
	Increased bleeding following extraction	2 (25%)
	Trismus	1 (12.5%)

**[Table/Fig-3]:** Knowledge and perception of AM among participating dentists.

Overall, eight participants (34.7%) had prescribed AM to patients before, mainly for external and internal sinus grafting (4/8; 50% for both) and surgical extraction of impacted teeth (2/8; 25%). Out of all, five participants (5/8; 62.5%) reported significant benefit with using AM following a surgical procedure. However, two participants (2/8; 25%) reported minimal benefit and one participant (1/8; 12.5%) reported no benefit at all. In terms of side-effects, four participants (50%) reported lip parathesia, altered taste sensation, increased bleeding, trismus and hypersalivation and all were minor and self limiting.

## DISCUSSION

The homeopathic agent AM is also known as leopard's bane and mountain tobacco, marketed and used for centuries for prevention of postprocedural ecchymosis and oedema as well as pain (commonly known as PSS) which may occur following skin, laser or cosmetic procedures [18]. Its flowers contain glycosides, tepinoids, amines, coumarins, and volatile oils and are available in different formulations including tablets (generally recognised as safe-Generally Recognised as Safe (GRAS) by Food and Drug Administration (FDA), and topical gel or spray which were recently approved by the German Commission E [19]. As of today, the exact

mechanism of AM has not been elucidated; however, it is believed to inhibit histamine release from mast cells, promote secretion of serotonin from platelets and thromboxane B2 formation [10]. Due to its historic application in the medical/dental field, this survey aimed at understanding the knowledge of practicing dentists on the indication and potential use of AM in the daily dental practise [6,7,20,21].

Most of the study participants were holders of master's degree in dental sciences or above (67.8%; 57/84). However, only 23 participants were familiar with AM application in the dental field. This could be attributed to the lack of sufficient research on its potential benefits. A previous cross sectional survey conducted among 250 practicing dentists in Germany reported AM among the most common homeopathic remedies prescribed (64%) mainly for PSS [22]. Another survey was conducted in West Bengal, India reported that among a total of 949 dental patients AM constituted 17.8% of all prescriptions [23]. Even with majority of participants were periodontists, oral medicine specialists and oral surgeons in this study, only 15 participants (65.2%) were familiar with AM benefit in preventions or reduction of PSE and pain. Considering the nature of surgical procedures performed regularly under these particular specialties, better knowledge and familiarity with AM use is expected among those specialists. This can be attributed in part to AM availability, cost, fear over side-effects and lack of standardised protocol for dental application [24,25].

Searching the current medical literature, several Randomised Clinical Trials (RCTs) evaluating oral AM as a prophylaxis agent for prevention of PSS have showed mixed outcomes in which few were related to the dental field [7,16,26-28]. This may explain the fact that only seven participants (30.4%) in this study were familiar with AM potential to prevent and reduce PSS, including PSE. The heterogenicity of available AM data could be linked to differences in type of surgical procedures techniques conducted and procedure duration [24,25,29]. The non standardised formulation of AM, dilution and manufacturing are other factors to consider when assessing available efficacy studies [24,25,29].

As of today, the application of AM in the dental field continues to be sparse and limited [28,30]. This could be attributed to several factors, most importantly the lack of evidence based indications and protocols for incorporating AM in the dental practice. A recent pilot study reported a role for AM in reducing oedema, pain and bruising following surgical extraction of impacted mandibular 3<sup>rd</sup> molars [28]. Even with a smaller sample study size (total of 30 extractions in which 22 were completed using AM), the study was able to demonstrate the first evidence supporting AM positive effect following dental surgeries. A recent review study reported on potential benefit from herbal extracts containing ethanolic extracts, including AM, in preventing and managing periodontal tissues inflammation due to their anti-microbial and anti-inflammatory effects [30]. No other studies on AM dental application exist in the literature.

In the current study, 19 participants (82.6%) reported surgical extraction of impacted teeth, followed by bone and soft tissue grafting procedures (10/23; 43.4% for both) as potential indications of AM for dental patients. Considering the common application of AM in procedures with high risk for oedema and haemorrhage, the reported responses fall within this spectrum [28,31]. A total of five participants (5/8; 62.5%) reported major benefit with using AM and two participants (2/8; 25%) reported minor benefit; however, it is hard to generalise these findings due to small sample size. Lack or limited patient's knowledge and awareness of AM availability as an agent to reduce their PSS experience as well as the poorly



characterised safety profile of oral AM could be other factors contributing to dentist's hesitation to offer this product to patients prior to dental surgical procedures. Literature reported toxicities include stomach irritation, dry mouth, headache, sore tongue, lethargy and drowsiness which were mild and well tolerated [32]. In addition, topical AM was associated with pruritus, petechiae and dry skin [32]. Compared to the present study's data, four participants (50%) reported parathesia of the lips, altered taste sensation, increased bleeding, trismus and hypersalivation as side-effect associated with AM use which was all mild and self limiting. Further, well-designed studies will help to confirm these findings and if other potential toxicities with AM use should be considered by health care professionals.

### Limitation(s)

This study had several limitations. First, the low number of participating dentists and diversity in their dental specialties; Second, the study subjects were citizens of seven countries in total and it would be more helpful to understand the perception toward AM use in other countries. Third, sampling bias may have not allowed for more precise representation of the dental community practice and use of AM.

### CONCLUSION(S)

This was the first survey to discuss the knowledge and application of AM among dentists from various specialties. Based on the current data, 27.3% of practicing dentists included in the survey were familiar with AM application in the dental field. In addition, 34.7% of the dentists who regularly prescribed AM for their patients reported promising outcome with minimal toxicities. Even with the study limitations, it shed the light on AM potential application in dentistry. Future randomised clinical trials are warranted to better understand the role of AM in the daily dental practice.

**Author contributions:** HM designed, conducted the study, analysed the data and prepared the manuscript. LE prepared the manuscript.

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**PLAGIARISM CHECKING METHODS:** [\[Jain H et al.\]](#)

- Plagiarism X-checker: Sep 22, 2021
- Manual Googling: Jan 10, 2022
- iThenticate Software: Jan 27, 2022 (3%)

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