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# "An Unexpected Anticholinergic Effect due to Yarrow (*Achillea millefolium*)"

## Civan Perçemine *(Achillea Millefolium)* Bağlı Beklenmeyen Antikolinerjik Etki

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**ABSTRACT**

Yarrow *(Achillea millefolium)* is a widely used plant in folk medicine due to its anti-inflammatory, anti-ulcer and estrogen-related effects. Some side effects including dermal allergic reactions have been reported owing to this herbal remedy. However, the literature about Achillea species do not include any side effects indicating anticholinergic toxicity. A 43-year-old female patient presented to the emergency department with blurred vision, dryness in the mouth, facial flushing and palpitation. She did not have any systemic illnesses and she denied taking any other herbal drugs or medications except yarrow tea (five cups a day, for one week), which she used for the treatment of menometrorrhagia. The constituents of the Achillea species identified in the former studies are highly bioactive, but their effects are not entirely known. Although the Achillea species have been considered as safe medicinal plants, the various pharmacological effects of Achillea species should be cautiously handled.

**Keywords:** *Achillea millefolium*, anticholinergic agents, emergency medicine
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**ÖZET**

Civan perçemi *(Achillea millefolium)*, halk arasında anti-inflamatuar, anti-ülser ve östrojen benzeri etkisi nedeniyle yaygın kullanılan bir bitkidir. Bu bitkisel tedaviyle ilgili olarak, içinde dermal alerjik reaksiyonların da bulunduğu bazı yan etkiler bildirilmiştir. Fakat achillea türleriyle ilgili literatürde antikolinerjik toksisiteye rastlanmamaktadır. Kırk üç yaşındaki kadın hasta acil servise görme bozukluğu, ağızda kuruluk, yüzde kızarma ve çarpıntı şikayetleriyle başvurdu. Bilinen sistemik bir hastalığı yoktu ve civan perçemi çayı (bir haftadan beri günde beş bardak) dışında kullandığı bitkisel bir ilaç veya tedavi bulunmamaktaydı. Bitkisel çayı, menometroraji şikayeti için kullandığını belirtmekteydi. Yapılmış çalışmalara göre achillea türlerindeki içerik oldukça biyoaktif olmakla birlikte, bitkinin tüm etkileri iyi bilinmemektedir. Achillea türlerinin tedavi amaçlı kullanımı güvenli kabul edilmiş olsa da, farklı farmakolojik etkileri dikkatle ele alınmalıdır.

**Anahtar Kelimeler:** Civan perçemi, antikolinerjik ajanlar, acil tıp
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## Introduction

*Achillea millefolium* (Asteraceae) is a widespread plant (Figure 1), found mainly in Asia, Europe and the USA. It flowers from June to September and widely used as a folkloric remedy to treat numerous illnesses (1).

Traditionally, it has been believed that the plant has anti-ulcer, anti-spasmodic, anti-inflammatory and anti-hemorrhagic effects. *Achillea millefolium* is mainly used for gastrointestinal disorders (dyspeptic complaints, hepato-biliary conditions), menstrual irregularities, cardiovascular diseases and pain management (2, 3). The plant's analgesic properties originate from its historical use as a wound-healing remedy by the Greek mythological hero Achilles. Currently, its extracts are also used for wound care and skin inflammation (3).

The pharmacological effects and usage area of Achillea species is relatively well-described in the literature, however much less is known of the potential toxic properties of its constituents (4). In humans, the only well-documented undesirable effect due

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Figure 1. *Achillea millefolium* (asteraceae)

to Achillea species is allergic contact dermatitis after dermal application. Also genotoxic and spermotoxic effects in animal research/*in vitro* studies have been reported (5).

Although the literature about in vitro activity of *Achillea millefolium* follows an increasing trend, studies involving human subjects are still lacking. We report a case with unexpected side effects due to *Achillea millefolium*, which were consistent with anticholinergic toxidrome.

## Case Report

A 43-year-old female patient presented to the emergency department with blurred vision, dryness in mouth, facial flushing and palpitation. She also suffered from generalized fatigue and weakness. Her symptoms became evident for five days, since she drank herbal tea, which was made of *Achillea millefolium*. She did not have any systemic illnesses except for menometrorrhagia. Although the patient had menometrorrhagia and abdominal pain intermittently for six months, she had refused to receive any medical help.

She did not take any regular medication and her diet had not changed recently. Also, she denied taking any other herbal drugs or medications except for yarrow tea (five cups a day, for one week), which she used for "antihemorrhagic" purposes. Later, it was observed that her herbal tea was a pure extract of *Achillea millefolium*.

Her body temperature was 37.3°C, blood pressure was 140/73 mmHg, and heart rate was 94 beats per minute with a normal sinus rhythm. On physical examination, she had bilateral mild mydriasis and her mucous membranes were dry. The abdomen was soft without rebound or guarding, and her bowel sounds were normal. Nevertheless, the patient declared that she had noticed constipation in recent days. Her palpitations became evident with little effort and without accompanying chest pain; at rest, she had no or minimal symptoms. The other physical examination findings were unremarkable and there was no evidence of a neuropsychiatric condition.

Complete blood count, renal and liver function tests, blood electrolyte levels, ECG and arterial blood gases were unremarkable; serum β-human chorionic gonadotrophin was negative. A diagnosis of anticholinergic toxicity was made, although she did not experience any seizure activity, myoclonic jerking, confusion or hallucinations, which could be seen in a typical anticholinergic substance overdose.

Our patient was discharged after six hours of observation, with suggestions related to herbal remedies. A follow-up visit one week after her discharge was normal, and all of her complaints were resolved.

## Discussion

Yarrow is an old herbal remedy, and has been used for different purposes in different cultural groups. Common European folk uses are for gastrointestinal disorders, menstrual disorders and topically for skin inflammation. In China, yarrow has been used for a variety of conditions such as bleeding and wounds, hemorrhoids, varicose veins, dysmenorrhea and tuberculosis (5). Applequist and Moerman emphasized the widespread usage of yarrow as an herbal remedy in Asia, Europe and at least 76 native American tribes. On the entire American continent, the most important uses were for skin problems and injuries, bleeding conditions, respiratory illnesses, digestive problems, toothaches and eye problems (5, 6).

From a phytochemical point of view, Achillea species contain terpenoids, lignans, flavonoids, amino acid derivatives, and a few other types of compounds (fatty acids, alkanes and inulin) (7). The constituents of the Achillea species identified in previous studies are highly bioactive, but all of the effects are not entirely known. The main biological activities of Achillea species are antimicrobial, antispasmodic and antispermatogenic effects; Achillea millefolium has been also used for digestive and cholagogue effects (7).

At the present time, *Achillea millefolium* is contained in industrial tea mixtures and in some phytopharmaceuticals (3). Our patient used its tea form for "antihemorrhagic" purposes and she benefited from Achillea. The anticholinergic side effects annoyed her after five days of drinking the herbal tea.

Spasmolytic activity is one of the important features of Achillea species. The spasmolytic activity of *Achillea millefolium* has been attributed to the flavonoids, which are a major component of the extract. Karamenderes et al. demonstrated that the ethanolic extract of this plant exhibits an inhibitory effect on the dose-response curves induced by acetylcholine and $CaCl_2$ on rat duodenum. Karamenderes attributed the antispasmodic effects of *Achillea millefolium* to inhibition calcium influx to cells in rats (8). The literature about Achillea species involving human subjects has failed to demonstrate any relationship between spasmolytic activity and anticholinergic manifestations. However, a considerable number of toxic plants cause anticholinergic toxicity (9, 10).

## Conclusion

To our knowledge, this is the first report of anticholinergic toxicity due to yarrow use. Although the Achillea species have been considered safe medicinal plants, the various pharmacological effects of Achillea species should be cautiously handled.

### Conflict of Interest

No conflict of interest was declared by the authors.

**Peer-review:** Externally peer-reviewed.

### Author Contributions

Concept - N.Ö.D.; Design - N.Ö.D., G.P.G.; Supervision - Y.Ç.; Analysis and/or Interpretation - N.Ö.D.; Literature Review - N.Ö.D., G.P.G., Y.Ç.; Writer - N.Ö.D.; Critical Review - Y.Ç., G.P.G., N.Ö.D.

### Çıkar Çatışması

Yazarlar herhangi bir çıkar çatışması bildirmemişlerdir.

**Hakem değerlendirmesi:** Dış bağımsız.

### Yazar Katkıları

Fikir - N.Ö.D.; Tasarım - N.Ö.D., G.P.G.; Denetleme - Y.Ç.; Analiz ve/veya yorum - N.Ö.D.; Literatür taraması - N.Ö.D., G.P.G., Y.Ç.; Yazıyı yazan - N.Ö.D.; Eleştirel İnceleme - Y.Ç., G.P.G., N.Ö.D.

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