PDF version

Short Research Communication

Ali Al Zahrani[1], Ali Alfakeeh[1], Waleed Alghareeb[1], Hatoon Bakhribah[1], Bassam Basulaiman[1], Abdullah Alsuhail
[2]
and Abdullah Alsharm
[1]

[1]Medical Oncology Department, Comprehensive Cancer Center, King Fahad Medical City, Riyadh, Saudi Arabia (Correspondence to A. Al Zahrani: almaalzahrani@kfmc.med.sa). [2]Pallia tive Care Medicine Department, Comprehensive Cancer Center King Fahad Medical City, Riyadh, Saudi Arabia

Abstract

Background: Complementary and alternative medicine is widely used in Saudi Arabia. One of the common practices is the use of camel urine alone or mixed with camel milk for the treatment of cancer, which is often supported by religious beliefs.

Aims: To observe and follow-up cancer patients who insisted on using camel urine, and to offer some clinically relevant recommendations.

Methods: We observed 20 cancer patients (15 male, 5 female) from September 2020 to January 2022 who insisted on using camel urine for treatment. We documented the demographics of each patient, the method of administering the urine, reasons for refusing conventional treatment, period of follow-up, and the outcome and side effects.

Results: All the patients had radiological investigations before and after their treatment with camel urine. All of them used a combination of camel urine and camel milk, and treatment

ranged from a few days to 6 months. They consumed an average of 60 ml urine/milk per day. No clinical benefit was observed after the treatment; 2 patients developed brucellosis. Eleven patients changed their mind and accepted conventional antineoplastic treatment and 7 were too weak to receive further treatment; they died from the disease.

Conclusion: Camel urine had no clinical benefits for any of the cancer patients, it may even have caused zoonotic infection. The promotion of camel urine as a traditional medicine should be stopped because there is no scientific evidence to support it.

Keywords: camel urine, camel milk, cancer, religious belief, complementary and alternative medicine, Saudi Arabia

Citation: Al Zahrani A, Alfakeeh A, Alghareeb W, Bakhribah H, Basulaiman B, Alsuhail A, et al. Use of camel urine is of no benefit to cancer patients: observational study and literature review. East Mediterr Health J. 2023;29(8):657–663. https://doi.org/10.26719/emhj.23.050 Received: 20/06/22; Accepted: 15/12/22

Copyright © Authors 2023; Licensee: World Health Organization. EMHJ is an open access journal. This paper is available under the Creative Commons Attribution Non-Commercial ShareAlike 3.0 IGO licence (CC BY-NC-SA 3.0 IGO; https://creativecommons.org/licenses/by-nc-sa/3.0/igo).

Introduction

Complementary and alternative medicine is widely used in Saudi Arabia as part of traditional healthcare and practice, and it is preferred by some cancer patients because they think it is natural and safer than chemotherapy and radiotherapy (1). One of the commonly used forms of complementary and alternative medicine is camel urine alone or in combination with camel milk. This practice is supported by a story from Islamic tradition (2,3).

We have noticed through our daily practice that many of our patients use this type of therapy on the recommendation of others and sometimes without informing their treating physicians. Healthcare providers do not recommend this treatment, especially for those who are still in

active conventional treatment, but many of our patients still insist on trying it.

Some preclinical data have shown some anticancer properties of camel urine but it has not been investigated clinically (5–7). Other cultures use urine from cows or other animals, and some even use human urine (16,20).

An outbreak of MERS-CoV occurred in Saudi Arabia in 2012 and camels were suspected as a possible original source of the virus. This led the WHO to recommended that any consumption of raw or undercooked animal products, including milk, urine, and meat, should be avoided (13,14).

In this study, we observed and followed up our cancer patients who insisted upon using camel urine, to establish exactly how they administered the urine and whether there were any clinical benefits or harm. This is possibly the first clinical report on the effect and side effects of camel urine on human cancer patients who insisted upon using camel urine instead of established antineoplastic agents.

Methods

We estimated that a sample size of 66 patients would be needed, based on the local prevalence of camel milk/urine consumption of ~24%. The sample size was calculated using the statistical formula n = Z2 P(1–P)/d2, where Z was the statistic corresponding to level of confidence, P was the expected prevalence, and d was the precision. We included patients who were supposed to start chemotherapy between September 2020 and January 2022 but refused medical treatment. The patients insisted upon using camel urine, despite receiving counselling that this type of treatment is unproven and any delay in their treatment might be harmful. The patients gave signed informed consent and baseline computed tomography and laboratory investigations were conducted. All patients were made fully aware that they could change their mind any time and return to their antineoplastic treatment. The study was approved by the local ethical committee of King Fahad Medical City (21-339).

All patients in the study used camel urine mixed with milk and nothing else, because the usual advice is not to mix it with other medication. We only observed the first 20 patients because we noticed that they all had disease progression and it would have been unethical to wait until we recruited the required 66 patients. We documented the demographics of each patient, urine use, reasons for refusing conventional treatment, duration of follow-up, treatment outcome, and side effects. The follow-up included history, physical examination, laboratory investigations,

tumour markers, and radiological investigations. All patients underwent a radiological or biochemical investigation or both before and after stopping consumption of camel urine. We decided to report the first 20 patients because the results may contribute to changing the current beliefs about consuming camel urine for cancer treatment.

Results

We interviewed 20 patients (15 male, 5 female) with different types of cancers at different stages. All patients underwent radiological investigations, mainly computed tomography, before and after finishing consumption of camel urine. Magnetic resonance imaging was also used for patients with brain tumours, rectal cancer, and soft tissue and bone sarcoma. We measured carcinoembryonic antigen for colon and oesophageal cancer, α-fetoprotein for hepatocellular carcinoma, and carbohydrate antigen 19-9 for hepatobiliary cancer. All patients used a mixture of camel urine and milk (Table 1). The duration of consumption ranged from 3 days to 6 months, and the average amount was ~60 ml/day (volumes were estimated because most patients did not use a measured container).

Twelve patients developed metastases and the others had locally advanced or recurrent cancer. None of the patients who continued to use camel urine showed any clinical benefit. There was no improvement in tumour-related symptoms, and patients showed radiological progression and an increase in tumour markers. Two patients developed brucellosis: 1 was successfully treated with antibiotics and returned to chemotherapy; and the other developed severe respiratory failure with lung infiltration with no obvious cause. No autopsy was done on the latter patient because this is not a routine procedure in our health system (except after a court request); however, the clinical features were similar to those of MERS-CoV pneumonia. The rest of the patients had disease progression. Eleven patients changed their mind and accepted conventional antineoplastic treatment but 7 were too weak to receive any further treatment and died and 2 are still being followed up (Table 1).

All of the patients believed that camel urine was a religious treatment and the advice came mainly from their community. One patient had followed specific instructions published on Twitter promoting a schedule for the use of camel urine for cancer treatment (27).

Discussion

The main support for the use of camel urine mixed with camel milk came from a story from Islamic tradition. Some people from the Orayna tribe that used to live in the central part of the Arabian Peninsula came to The Prophet in Medina pretending to be Muslims. They could not tolerate city life and became unwell and had abdominal distention. The Prophet asked them to

go outside the city to a herd of camels, and told them to drink their milk and urine as a medicine because it was a common practice for those living in the desert. After doing so, they became healthy (2,3). There is disagreement among Islamic scholars about whether camel urine is unclean. The Maliki and Hanbali schools of jurisprudence hold that the urine of animals whose meat can be consumed is considered to be clean (4). In contrast, the Shafii and Hanafi schools consider camel urine to be unclean. The Prophet's recommendation to use camel urine was only in an emergency, for a specific illness, and because no clean medicine was available (4).

There were some preclinical studies that claimed that camel urine had several therapeutic benefits, such as antimicrobial, anti-inflammatory, and anticancer activities, and even some beneficial cardiovascular effects. One study showed that camel urine inhibited growth of hepatocellular carcinoma (HEPG2), colon carcinoma (HCT 116), human glioma (U251), lung cancer, and leukaemia cells (5). Other studies showed that camel urine blocked cytochrome P450 1a1, a cancer-causing gene, and inhibited inflammatory angiogenesis, which can supply nutrition to tumours (6,7). Successful anticancer agents kill cancer cells or prevent their proliferation without negatively affecting normal cell growth or disrupting the immune system (8). These features were claimed to have been seen in another study of camel urine (9). A variety of tests conducted in vivo and in vitro demonstrated the ability of camel urine to reduce or prevent the metastatic potential of breast cancer cells (10).

The possible mechanism of action of camel urine was through apoptosis and suppression of cancer cells (10). The possible anticancer properties of camel urine have been vaguely demonstrated using gas chromatography/mass spectrometry and inductively coupled plasma mass spectrometry (11). That study showed higher concentrations of metabolites such as canavanine in camel urine than in other mammals' urine. Canavanine is a byproduct of amino acid and urea metabolism, and according to that study, it was potent in combating tumour cells. Camel urine has a low amount of urea and ammonia that may decrease its unpleasant odour and toxicity when consumed by humans; however, there is a large amount of creatine and creatinine, which are toxic to humans (12). The mineral content of camel urine is 10-fold greater than that of human urine, and it is usually alkaline with pH > 7.8, while human urine is usually acidic (12).

MERS was first discovered in 2012 in Saudi Arabia and Jordan, and camels were identified as the reservoir host. This disease spreads through close contact, directly or indirectly, with camels and can spread among infected humans (13). The causative agent MERS-CoV is a zoonotic virus that spreads from animals to humans. The disease was found to be harmless to camels but infection in humans can be severe, with 35% of all human cases resulting in death. To date, 27 countries have been affected by MERS. The method of transmission of MERS-CoV from animals to humans remains unknown. Therefore, WHO recommends that any activities related to camels must be avoided, such as close contact with dromedary camels, drinking raw camel

milk or urine, or eating meat that has not been properly cooked (14).

None of the basic scientific studies about the use of camel urine in cancer patients present sufficient evidence for its use in modern medicine. Most studies are still in their early stages, using in vivo and in vitro studies on animal cells, and do not involve actual patients. There are major concerns about the correlation between preclinical and clinical data. They are not always strongly correlated and the activity of some anticancer agents in preclinical studies has not been translated into clinical benefit (26). An analysis was carried out by the National Cancer Institute Developmental Therapeutics Program on the activity of 39 compounds tested preclinically in vivo and in vitro assays, and comparing the results with corresponding data from Phase 2 clinical trials (15). The results indicated the weak correlation of preclinical models with clinical results and confirmed the need for clinical trials before approving any therapeutic methods.

Urine from other species is used worldwide. In some areas, consumption of human urine is practiced and it became popular after publication in the early 20th century of Water of life by the British naturopath John W. Armstrong (16). Human urine mainly consists of water (> 95%). The remaining constituents are urea 9.3 g/l, chloride 1.87 g/l, sodium 1.17 g/l, potassium 0.750 g/l, creatinine 0.670 g/l, and other dissolved ions and inorganic and organic compounds (17). Although it is widely used, there is no scientific evidence for therapeutic use in humans and harmful effects have been reported (18). Urine from goats, sheep, elephants, donkeys, and other animals has also been used for treatment by different cultures (19). In India, cow urine was studied in preclinical trials (20). It was found to contain nitrogen, sulfur, phosphate, sodium, manganese, iron, silicon, chlorine, magnesium, maleic, citric, and tartaric acids, calcium salts, vitamins A–E, minerals, lactose, enzymes, creatinine, and hormones. The authors claimed that the ingredients in cow urine were similar to those in the human body, which is why they thought it could maintain the balance of these substances in humans if ingested, and may even cure some diseases (20). The United States of America has granted patents (Nos. 6,896,907 and 6,410,059) for the medicinal properties of cow urine, with particular mention of its bioenhancer, antibiotic, antifungal, and anticancer properties. Cow urine increased the potency of paclitaxel against MCF-7, a human breast cancer cell line, in in vitro assays (US Patent No. 6,410,059) (21). The composition of cow urine is similar to that of other types of urine; it is mainly water (95%) and urea (2.5%), with the remainder made up of minerals, salts, hormones, and enzymes (2.5%) (22). According to a study from India, there was some evidence that cow urine had antioxidant properties and the ability to repair damaged DNA, and was therefore, an effective anticancer therapy (23). In a study of regression of induced papilloma in Swiss albino mice, cow urine reduced the incidence of papilloma, tumour yield, and tumour burden (24). In a study of different types of cancer, cow urine caused a decrease in the severity of clinical symptoms (pain, inflammation, burning sensation, difficulty swallowing, and irritation) from day 1 to day 8 (25).

None of our cancer patients showed any clinical benefit from the use of camel urine and this was documented as radiological progression, increase in tumour markers, or both. Two of the patients developed brucellosis, and 1 was successfully treated with antibiotics and returned to chemotherapy. There was 1 patient with possible MERS who died undiagnosed. This was not confirmed by laboratory testing but diagnosis of MERS was supported by the clinical and radiological features.

We know that > 95% of urine is composed of water and the remaining 5% is trace elements. The preclinical studies on camel urine were performed on these trace elements. Most of those studies suggested that the effectiveness of camel urine was because of the presence of trace elements that had anticancer activity. However, for the trace elements to have a clinical effect a patient would need to drink a huge volume of urine, and even then, the trace elements would be diluted. We also know that not all preclinical trials can be translated into clinically beneficial outcomes. It has been reported that only 5 in 5000 medications will progress successfully from preclinical to clinical studies, and only 1 of the 5 will be clinically beneficial, and even that may not be better than existing medication (26).

When we look to the story that happened 1440 years ago, which supported the use of camel urine, it definitely does not describe cancer patients because the patients appeared to have symptoms of a communicable disease that developed over a short period. Many Islamic scholars believe that the advice to drink camel urine and milk was specific to those particular people because they were used to the practice, but it was not common among others.

Conclusion

To the best of our knowledge, this is the first study to explore the clinical benefit of camel urine for treatment of cancer patients. All our cancer patients who insisted upon using camel urine did not have any significant clinical benefits and we do not recommend its use. Some of our patients presented with serious side effects. Two patients developed brucellosis because of the advice to use raw unboiled camel urine and camel milk to obtain the maximum benefit. We reported the results from a smaller number of patients than initially planned because we considered it important that promotion of this type of treatment as a traditional medicine should be stopped, because there is no evidence to support it scientifically.

Funding: None.

Conflict of interest: None declared.

Absence de bénéfices de l'utilisation d'urine de chameau pour les patients cancéreux : étude observationnelle et examen de la littérature

Résumé

Contexte : La médecine complémentaire et alternative est largement utilisée en Arabie saoudite. L'une des pratiques courantes est l'utilisation d'urine de chameau seule ou mélangée à du lait de chamelle pour le traitement du cancer, ce qui est souvent étayé par des croyances religieuses.

Objectifs : Observer et suivre les patients atteints de cancer qui insistaient à utiliser de l'urine de chameau, et proposer des recommandations cliniquement pertinentes.

Méthodes : Nous avons observé 20 patients atteints de cancer (15 hommes, 5 femmes) de septembre 2020 à janvier 2022 qui insistaient à utiliser de l'urine de chameau pour leur traitement. Nous avons documenté les caractéristiques démographiques de chaque patient, la méthode d'administration de l'urine, les raisons du refus du traitement conventionnel, la période de suivi, ainsi que les résultats et les effets secondaires.

Résultats : Tous les patients ont subi des examens radiologiques avant et après leur traitement à l'urine de chameau. Ils ont tous utilisé une combinaison d'urine et de lait de chamelle, et la durée du traitement variait de quelques jours à six mois. Ils ont consommé en moyenne 60 ml d'urine/de lait par jour. Aucun bénéfice clinique n'a été observé après le traitement ; deux patients ont développé une brucellose. Onze patients ont changé d'avis et ont accepté un traitement antinéoplasique conventionnel et sept patients étaient trop faibles pour recevoir un traitement supplémentaire ; ils sont morts des suites de la maladie.

Conclusion : L'urine de chameau n'a apporté aucun bénéfice clinique aux patients atteints de cancer, et peut même avoir provoqué des infections zoonotiques. La promotion de l'urine de chameau en tant que médecine traditionnelle doit cesser, car il n'existe aucune preuve scientifique à cet égard.

[illegible]

[illegible]

[illegible]

[illegible]

4. Mohammad I. Alshangeti Sharh Zad Almostagnae, book 23, page 9. Riyadh: General Presidency of Islamic Research and Ifta; 2007.

5. Khorshid, F. Preclinical evaluation of PM 701 in experimental animals. Int J Pharmacol. 2008;4(6):443–51. https://doi.org/10.3923/ijp.2008.443.451

6. Alhaider AA, El Gendy MAM, Korashy HM, El-Kadi AOS. Camel urine inhibits the cytochrome P450 1a1 gene expression through an AhR-dependent mechanism in Hepa 1c1c7 cell line. J Ethnopharmacol. 2011 Jan 7;133(1):184–90. https://doi.org/10.1016/j.jep.2010.09.012 PMID:20883769

7. Alhaider AA, Gader AGM, Almeshal N, Saraswati S. Camel urine inhibits inflammatory angiogenesis in murine sponge implant angiogenesis model. Biomed Aging Pathol. 2014 Jan–Mar;4(1):9–16. https://doi.org/10.1016/j.biomag.2013.10.003

8. Ali A, Baby B,Vijayan, R. From desert to medicine: a review of camel genomics and therapeutic products. Front Genet. 2019 Feb 19;10(17):1–20. https://doi.org/10.3389/fgene.2019.00017 PMID:30838017

9. Al-Yousef N, Gaafar A, Al-Otaibi B, Al-Jammaz I, Al-Hussein K, Aboussekhram A. Camel urine components display anti-cancer properties in vitro. J Ethnopharmacol. 2012 Oct 11;143(3):819–25. https://doi.org/10.1016/j.jep.2012.07.042 PMID:22922085

10. Romli F, Abu N, Khorshid FA, Syed Najmuddin SUF, Keong YS, Mohamad NE, et al. The growth inhibitory potential and antimetastatic effect of camel urine on breast cancer cells in vitro and in vivo. Integr Cancer Ther. 2017 Dec;16(4):540–55. https://doi.org/10.1177/1534735416656051 PMID:27338742

11. Ahamad SR, Alhaider AQ, Raish M, Shakeel F. Metabolomic and elemental analysis of camel and bovine urine by GC–MS and ICP–MS. Saudi J Biol Sci. 2017 Jan 24(1):23–9. https://doi.org/10.1016/j.sjbs.2015.09.001 PMID:28053567

12. Read BE. (1925). Chemical constituents of camel's urine. J Biol Chem. 64:615–7.

13. Zaki AM, van Boheemen S, Bestebroer TM, Osterhaus AD, Fouchier RA. Isolation of a novel coronavirus from a man with pneumonia in Saudi Arabia. N Engl J Med. 2012 Nov 8;367(19):1814–20. https://doi.org/10.1056/NEJMoa1211721 PMID:23075143 Erratum in: N Engl J Med. 2013 Jul 25;369(4):394.

14. Middle East respiratory syndrome coronavirus (MERS-CoV) [website]. Geneva: World Health Organization; 2019 (https://www.who.int/health-topics/middle-east-respiratory-syndrome-coronavirus-mers#tab=tab_1, accessed 15 February 2023).

15. Johnson J, Decker S, Zaharevitz D, Rubinstein LV, Venditti JM, Schepartz S et al. Relationships between drug activity in NCI preclinical in vitro and in vivo models and early clinical trials. Br J Cancer. 2001 May 18;84:1424–31. https://doi.org/10.1054/bjoc.2001.1796 PMID:11355958

16. Armstrong JW. The water of life: a treatise on urine therapy. Random House; 2011.

17. Putnam DF. Composition and concentrative properties of human urine. NASA; 1971.

18. Ogunshe AAO, Fawole AO, Ajayi VA. Microbial evaluation and public health implications of urine as alternative therapy in clinical pediatric cases: health implication of urine therapy. Pan Afr Med J. 2010 May 25;5:12. https://doi.org/10.4314/pamj.v5i1.56188 PMID:21293739

19. Thakur AN. Therapeutic use of urine in early Indian medicine. Indian J History Sci. 2004;39(4):415–27.

20. Pathak ML, Kumar A. Cow praising and importance of Panchyagavya as medicine. Sachitra Ayurveda 2003;5:569.

21. Randhawa GK. Cow urine distillate as bioenhancer. J Ayurveda Integr Med 2010 Oct;1:240–1. https://doi.org/10.4103/0975-9476.74089 PMID:21731367

22. Cow urine content [website] (http://samvadsetu-gaumata.blogspot.in/2010/12/cow-urine-content.html, accessed 15 February 2023).

23. Kumar A, Kumar P, Singh LK, Agrawal OK. Pathogenic effects of free radicals and their prevention through cowpathy. Indian Cow 2009;6(21):4–8.

24. Raja W, Agrawal RC. Chemopreventive potential of cow urine against 7, 12 dimethyl benz(a) anthracene-induced skin papillomasgenesis in mice. Acad J Cancer Res. 2010;3(1):7–10.

25. Jain NK, Gupta VB, Garg R, Silawat N. Efficacy of cow urine therapy on various cancer patients in Mandsaur District, India – a survey. Int J Green Pharm. 2010;4:29–35.

26. Kraljevic S, Stambrook PJ, Pavelic K. Accelerating drug discovery. EMBO Rep. 2004;5(9):837–42. https://doi.org/10.1038/sj.embor.7400236

27. Faten Khorshid. The quantities that a person can consume of camel milk and urine and the method of changing the taste. Twitter, 14 January 2022. https://twitter.com/FatenProf/status/1536550514850152449?t=aC9oTmwwvt7_PPblEUKh9Q&s=08.

Thursday 11th of July 2024 10:14:04 PM