Wine and treatment of genitourinary disease: from antiquity to modern times

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Objective: *Wine is one of the oldest documented medicinal remedies, dating back thousands of years. We explore the medicinal uses of wine, with a focus on the treatment of genitourinary disease, beginning in ancient Egypt, India, and Israel, and then moving forward to include Greek, Roman, and Arabic medicine. Our review continues into the Middle Ages and renaissance, and finally evaluates the medicinal properties of wine as we understand them in our current scientific paradigm and its specific application to urology.*

Methods: *A review of the literature was completed, reviewing the medical theories and medicinal uses of wine from ancient civilization to the present.*

Results: *Wine has been used in the treatment of genitourinary disease for thousands of years. This agent has been employed by physicians in nearly all cultures and in all eras of medical history. Medical uses include, but are not limited to, appetite stimulant, anesthetic, tonic, antiseptic, vasodilator, diuretic, antibacterial agent, and diaphoretic. The physiologic properties and value of this ancient medicine continue to be studied today.*

Conclusions: *The medicinal use of wine has common applications over thousands of years and multiple civilizations. The pharmacologic and physiologic properties of this agent continue to be studied and applied in the modern era and continue to be relevant in the field of urology.*

Key Words: history of medicine, wine, urologic diseases

Introduction

Wine is among the oldest of medicines, utilized in multiple civilizations over thousands of years. This common beverage has intrinsic medicinal properties that were used in the treatment of a variety of diseases. We explore the medicinal use of wine, with a focus on the treatment of genitourinary disease, beginning in ancient Egypt, India, and Israel, and then moving forward to include Greek, Roman, and Arabic medicine. Our review continues into the middle ages and renaissance. Finally we evaluate the pharmacologic and physiologic properties of wine as they are understood in our current scientific paradigm, with a specific focus on urology.

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Materials and methods

A review of the literature, including journals and historical texts, was completed, reviewing the medical theories and medicinal uses of wine from ancient civilizations to the present. In addition, a review of the physiologic and pharmacologic properties of wine as they apply to the treatment of genitourinary disease was completed.

Discussion

In ancient Egypt, even prior to the Old Kingdom, there is evidence of wine being used as a medicine. A recent analysis of 700 wine jars from the tomb of Scorpion I (3150 BCE) in Abydos shows evidence of herbal medicines being steeped in wine.[1] Several herbal residues were identified including coriander, which later is explicitly mentioned in several medical prescriptions.[1] In the Old Kingdom (2700-2190 BCE), the medicinal use of wine is well documented through

medical papyri, carvings on tombs, Figure 1, and other texts.[2,3] One of the oldest inscriptions that depicts winemaking is found in the tomb of Ptah-Hotep, who lived in northern Egypt approximately 2400 BCE. Egypt possessed an advanced and sophisticated medical system which employed a large pharmacopia.[3] The Ebers Papyrus, a medical text from the Old Kingdom, contains 875 paragraphs, constituting a treatise on pharmacology and therapeutics.[3] Some four hundred drugs are mentioned, with wine and honey found in recipes for the treatment of multiple diseases, including the treatment of genitourinary disease.[3] Examples include "urine too plentiful or too often", "to eliminate hurrying of the urine", "to put the urine in order", and "to eliminate heat in the bladder when he suffers from retention of urine."[4] Following circumcision, wine was used as a topical agent to stop bleeding and speed the healing process.[2,5] The Hearst Papyrus specifies the use of wine in twelve prescriptions.[2] Wine was added to recipes to create a desired volume of a solution or added to recipes as a method for ingesting the active agent. Recipes in the Ebers Papyrus describe placing medicines in wine to soak over night before drinking.[4] In ancient Egypt, it would have been possible to attain an alcohol concentration of up to 20%.[4] This amount of alcohol would be sufficient for the extraction of alkaloids, the active agent in many herbal medicines including opium, cannabis, and mandrake, all of which were used in ancient Egypt.[4] It is possible that the ancient Egyptians noticed an increase in the potency of a drug after letting it soak in wine. This may have led to the following sound advice found in the Isinger Papyrus, "He who has too much wine will be filled up, a hangover will keep him in bed."[3]

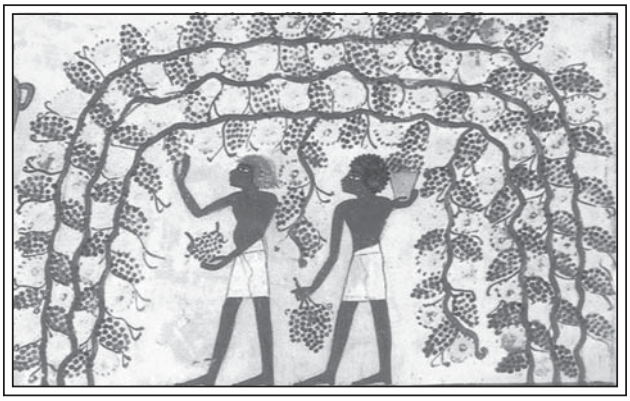

Figure 1. Harvesting grapes, portion of a wall painting from the Tomb of the Egyptian official Nakht, Thebes, Cairo, 1400 BCE/Tomb of Nakht/Wikimedia Commons/Public Domain.

Medicine in Ancient India developed independently of that in Egypt and existed long before Ancient Greece.[2] Ancient Indian medicine was highly advanced for its time. Their medical system pioneered operative surgery, prescribed diets, and used hundreds of medicinal plants, as well as fermented beverages.[2] In the Vedic period (1500-500 BCE), the beverage Soma was worshiped as a deity in liquid form and was credited with healing powers.[6] Soma was believed to be able to cure all illnesses, and multiple hymns were written of its wonders.[6] One example comes from a passage in the Atharva-Veda, an Ancient Indian text: "O' Soma and Rudra, drive away the diseases that has entered our household."[6] Some historians believe Soma was the fermented juice of the East Indian vine *asclepias acida*.[2,6] At some point in Vedic history the medicinal powers of Soma became attributed to wine. The Atharva-Veda discusses the medical value of wine, stating, "If taken as medicine, and not for intoxication, it acts as Soma, it cures the natural flow of internal fluids of the body."[2] At this period in time, the word "wine" was applied indiscriminately to a number of alcoholic beverages including fermented honey called *madhu*.[2] The Vedic texts are also thought to contain the first documented use of wine as an anesthetic for the purposes of surgery.[2]

Some of the oldest findings of wine come from the land of Israel and its surrounding countryside.[7] Grapes thrived in the Mediterranean climate and wine was cultivated as a beverage used for sustenance, trade, and medicinal purposes, Figure 2. Rabbinic sources discuss a recipe of wine cooked with ground saffron to treat impotence.[7] Wine was also given to infants prior to circumcision for purposes of analgesia, a practice that still exists today.[7] The ancient city of Ashkelon was famous for producing a particular wine considered ideal for medical treatments. One general recipe for healing, dating around 361 CE, called for 21 cups of Ashkelon wine, 7 cups of honey, and 200 chamomile seeds, boiled for 21 days and then filtered.[7] Ashkelon wine was prescribed with each meal to encourage urination and also used in the treatment of renal colic, urinary obstruction and kidney stones.[7]

Greek physicians continued to employ wine in the practice of medicine. Hippocrates of Cos (460 to 370 BCE) was a great proponent of the medicinal use of wine. His Regimen in Acute Diseases remarks on therapy in sickness including the use of wine as a wound dressing, nourishing dietary beverage, cooling agent for fevers, and diuretic.[8] Hippocrates was one of the first to describe the different effects of wine based on the type of grape. He also established criteria to determine which type of wine was recommended for

Figure 2. Floor mosaic from the Church of the Holy Martyrs Lot and Procopius, Mt. Nebo, Jordan, 6th century CE/Wikimedia Commons/Public Domain.

a particular condition; sweet, vinous, white or dark. Sweet wine was believed to produce less heaviness in the head, compared to vinous wines, but caused swelling of the liver and spleen. It made bilious patients thirsty and caused flatulence in the upper gastrointestinal tract. Sweet wines also had more expectorant properties, but less diuretic and laxative effects than other wines. Both white wine and dark wine were used in acute diseases as long as there was no "heaviness in the head,"[8] Figure 3.

In Ancient Rome, Andromachus the Elder, chief physician to Nero (Roman Emperor 54-68 CE), attained great fame for his antidote "Galene", which was composed of 73 ingredients, all mixed in wine. This antidote was said to relieve inflammation of the bladder and kidneys. Pliny the Elder wrote 12 books in Natural History, which are dedicated to medicine in which he mentioned 200 varieties of grapes and 18 varieties of sweet wine, including a recipe for the conception of beautiful and virtuous children. Pliny also ascribed special virtues to "mulsum," a honeyed wine that was said to give a man "vigor of mind and body."[2] Dioscorides wrote *de universa medicina* in approximately 78 CE on medical botany as an applied science. This text included descriptions of hundreds of substances and their therapeutic values. He advised the use of wine for countless ailments, always specifying the type of wine and its specific effects on the kidneys and bladder. For "ye griefs of ye bladder and kidneys," he recommended vinum passum (raisin wine). An ointment made from dried flowers of the wild grapevine could be applied topically for genital sores.[2]

Following the death of Mohammed in 632 CE, Arabic culture accelerated the study of algebra, chemistry, medicine and that of chemical therapeutics.[2] Within the Moslem Empire, the language was Arabic and the religion Islam, but in reality there was a blend of Greek, Babylonian, Hebrew, and Indian cultures. There was a strong influence of Greek medicine, which included the medicinal use of wine.[2] Wine, though forbidden as a food, could be prescribed as a medicine.[2] At the same time Islamic physicians were writing essays addressing the harms of intoxication, they produced literature on the medicinal value of wine.[2] Avicenna (980-1036 CE), the chief physician of the Baghdad public hospital, wrote a medical text titled a *Canon of Medicine*, which was used worldwide throughout the medical community until 1650.[2] This text contained discussions of the therapeutic properties and appropriate uses of wine. The diuretic effects were documented, stating "Wine is beneficial for persons with a predominance of bilious humor, because it gets rid of the excess of this by provoking the urine."[2] He proposed the use of honeyed wine for gout, which during that time referred to joint pain.[2]

The *Arabian Nights* are a famous set of tales centered around life in Baghdad 766-809 CE, which is believed to have been influenced from ninth century Persian sources.[2] Within *Arabian Nights* is a passage discussing the therapeutic value of wine with a reference to the urinary tract: "As for the advantages that be therein, it [wine] disperseth stone and gravel from the kidneys

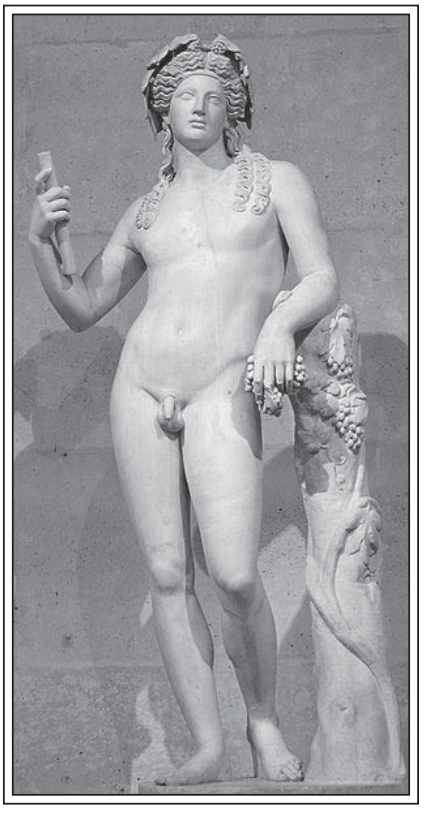

Figure 3. Statue of Dionysus, marble, second century CE, Richelieu Collection, Musee du Louvre, Paris, France/Wikimedia Commons/Public Domain.

. . . it contracteth the bladder, enforceth the liver and removeth obstructions . . ."[2]

Much medical knowledge was lost during the Middle Ages. Fortunately, the medicinal use of wine survived this dark period in history. Arnald of Villanova, a Spanish physician, writer, and advisor to popes and kings, taught at the medical school of Montpellier. It was there that he treated Pope Boniface VIII for "the stone," using wine as therapy.[9] In 1299, during the Inquisition, he was convicted of theologically unorthodox therapies in Paris.[9] Had his life not been spared by Pope Boniface VIII, he would not have written *Liber de Vinis* in 1310, in which he described 49 medicinal wines used for multiple diseases. This book, which described specific wines to treat urologic diseases, was a "best seller" among medical books in the 15th and 16th centuries.[9] He believed gold leaves quenched in wine relieved urinary retention and also treated epileptics, lunatics and lepers. Elecampane wine removed "anger and sorrow" through the kidneys and fennel wine increased both libido and sperm count. Combining fennel wine with fennel roots improved diseases of the kidney and cured diseases of the bladder. Anise wine plus sugar taken with diadragantu and dianisu relieved pain associated with stones and helped with their passage. Wormwood wine, when combined with sugar and honey, improved urinary retention as well as alleviated nausea and vomiting. Winter cherry wine improved urinary retention and extracted "sandy matter" from the kidneys and bladder. In fact, this exact remedy was used to treat a Cardinal who was in retention for 3 days.[9]

In 1733, the German physician Johan Herman Francken described the surgical management of both kidney and bladder stones in a treatise entitled "On the Excision of Stones, Both Above and Below the Pubic Bone." He recommended that warm French wine be instilled into the bladder during the procedure so that "all remnants of sand and mucous may bubble out." After surgery, the cystotomy wound was bandaged with cloths soaked in French wine. To prevent incontinence postprocedurally due to sphincter dilation, cloths soaked in warm wine would be placed on the genitals and a solution made of camphor, spiritus vini rectificatus and drachm was applied on the bladder neck every hour. For stones below the pubic bone, the bladder was opened and the stone was removed. The bladder was then washed with wine the "temperature of piss" until only clear wine came out of the wound. After the incision was closed, bandages soaked in wine were applied to the wound, buttock, scrotum and abdomen.[10]

An enormous amount of research has involved the study of wine and health. Many papers have compared people who drink alcohol in moderation with those who abstain from alcohol. Beneficial effects have been reported in a number of diseases including atherosclerotic disease, hypertension, cancer, kidney stones, osteopenia, gall stones and cognitive function.[11] A review paper by de Lorimier on the subject of alcohol and health, showed that wine, particularly red wine, has high levels of phenolic compounds.[11] Phenols (flavanoids, polyphenols, nonflavanoid phenols, and tannins) are beneficial in several biochemical systems. They increase high density lipoprotein cholesterol and antioxidant activity, decrease platelet aggregation and endothelial adhesion, promote nitric oxide production, and suppress cancer cell growth.[11] In addition, an analysis of 45,289 men in the Health Professionals Follow up Study concluded that for each 240 ml serving of wine consumed daily, the risk of kidney stone formation decreased by 39%.[11] This was corroborated by a similar study of 81,093 women in the Nurse's Health Study.[11]

Several studies have looked at the protective effect of red wine on the kidney. A paper by Pechanova et al reviewed the antioxidant effects of polyphenolic compounds on renal tissue.[12] Reactive oxygen species (ROS) are harmful to cells, leading to structural and functional impairments.[12] Dietary supplements with naturally occurring antioxidants can attenuate renal damage caused by oxidative challenges.[12] Polyphenolic compounds from red wine act as ROS scavengers and augment the production of nitric oxide (NO) by increasing NO synthase activity and endothelial nitric oxide synthase (eNOS) protein expression and decrease the oxidative stress within the kidney.[12]

Rodrigo et al studied the effect of wine polyphenols on renal damage caused by rhabdomyolysis in rats.[13] They found that pretreatment with chronic red wine exposure protected against renal damage caused by rhabdomyolysis.[13] Monilla et al evaluated the effects of red wine on nephropathy in Streptozotocin (STZ) induced diabetic rats.[14] Red wine was given to the diabetic and normal rats 2 weeks before and 4 weeks after STZ injection. They found that treatment with red wine significantly protected against diabetic nephropathy.[14]

The anticarcinogenic effects of red wine have also been a topic of interest. Malaveille et al examined the dietary properties of phenolics as inhibitors of tobacco-related damage to urothelium in smokers.[15] Their study suggested that ingesting dietary phenolics, such as those found in red wine, act as urinary antimutagens.[15] The smokers in their study who ingested phenolics

were partially protected against tobacco carcinogens within their bladder mucosa.[15] The question was raised of whether this benefit could protect against the formation of urothelial carcinoma.

Conclusion

The medicinal uses of wine have had common applications over thousands of years and multiple civilizations. The pharmacologic and physiologic properties of this agent continue to be studied and applied in the modern era and continue to be relevant in the field of urology. □

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