Embalming: The Negative Effects of Formaldehyde

Student Name

NorQuest College

ENGL 2550 A03

Instructor Name

Assignment 2C: Critical Analysis

Due Date
Abstract

Current day embalming standards use high amounts of formaldehyde, which is toxic to the health of funeral workers, medical students and the environment. The use of formaldehyde can be significantly reduced or eliminated while still producing a high quality preserved cadaver. Conservation or natural burials, where the embalming process is eliminated, must become an option for those planning funerals. With so many alternatives for cadaver preservation, the use of formaldehyde is unjustified.
Embalming: The Negative Effects of Formaldehyde

While death is a part of life, most people do not consider how their funeral plans may affect the health of the funeral workers and the environment in general. Today the process of planning a funeral seems almost mechanical: embalm the body, view the body, and bury the body all without consideration as to how this will affect the health of the public and the environment. Because current standards for embalming use high concentrations of formaldehyde, a substance that is toxic to individuals and the environment, the procedures for cadaver preservation must include the reduction or elimination of the use of formaldehyde.

The History of Embalming

Shortly after death, body changes begin to happen at a chemical and physical level that causes alterations (such as decomposition) to the body both internally and externally (Khouri, 2012). The most common method to delay the decomposition of the body is embalming. Embalming has been used for thousands of years in various parts of the world, but it did not become common practice in North America until after the American Civil War. At that time, Dr. Thomas Holmes was asked to create a way to preserve the deceased soldiers’ bodies to allow them to be transported back to their loved ones. His original embalming mixture contained arsenic, a venomous chemical that was known to cause sickness and disease. This embalming technique was used until the early 1900s when the harmful effects of arsenic caused it to be banned for the use of embalming (Chiappelli & Chiappelli, 2008). Once arsenic was banned, another chemical began being commonly used in embalming, using similar techniques:

Modern embalming entails replacing the blood with an embalming fluid. A slit is made in the artery and the embalming hose is inserted. The blood is drained and disposed of via the regular sewer (...) red coloring is added to the embalming fluid to give the bodies a
natural colouring. The primary ingredient in most modern embalming fluids is formaldehyde. (Chiappelli & Chiappelli, 2008, p. 24)

Formaldehyde has replaced arsenic for contemporary embalming, but it is simply another dangerous chemical.

**Dangers of Formaldehyde**

Due to its toxicity, many known diseases have been directly linked to long term formaldehyde exposure. Chiappelli & Chiappelli (2008) state, “[t]he modern practice of embalming replaces organic blood with various toxic and carcinogenic chemicals, particularly formaldehyde” (p. 24). According to the United States Occupational Safety and Health Administration, formaldehyde is listed as a toxic chemical, and for good reason. The Administration states that over an eight hour work day the maximum formaldehyde exposure level should be no more than 0.75 ppm. An average embalmer is exposed to approximately 9 ppm during the embalming process, more than twelve times the recommended ‘safe’ amount (Chiappelli & Chiappelli, 2008).

**Exposure to Formaldehyde**

Constant exposure to formaldehyde is common among funeral workers, specifically embalmers who handle high amounts of this cancer causing-substance on a daily basis. Iserson found that “embalmers are at a significantly greater risk than the general populace of getting cancers of the skin, brain, colon, sinuses, nose, throat and blood, kidney failure, arteriosclerotic heart disease, chromosomal damage and cirrhosis of the liver” (as cited in Chiappelli & Chiappelli, 2008, p. 25). Due to the high exposure levels, it is no surprise that many known diseases caused by formaldehyde frequently affect embalmers.
**Negative health effects.** While there are many long term effects due to formaldehyde exposure, the immediate effects felt during or shortly after exposure are just as concerning. As formaldehyde fumes are often inhaled, irritations of the upper respiratory tract are a common complaint among embalmers, as well as a burning feeling in the nose and throat (Khouri, 2012). Even though protective clothing and masks are worn in the embalming room, formaldehyde is still able to cause ill effects to the funeral workers. Other common short term ailments include nasal, eye and skin irritations, bad taste in the mouth, dizziness, headache, nausea and vomiting (Khouri, 2012). Some people have a high tolerance to formaldehyde and may not notice any of these symptoms while others may experience many, even if only exposed for a minimal amount of time. Even though symptoms may not be felt immediately, constant exposure to formaldehyde can lead to serious health problems years later.

**Workers at Risk**

Along with funeral workers, medical and nursing students are also at risk for higher than recommended formaldehyde exposure. Visiting a cadaver lab is a common and important part of most medical and nursing programs. By embalming the body beforehand, decomposition is delayed, allowing the required time for students to dissect and study the human body (Khouri, 2012). Often, higher amounts of formaldehyde are introduced into cadavers being used for medical study to prevent decomposition for weeks, as opposed to several days as when preparing for a funeral. With so many apparent risks, it is unclear why formaldehyde is still so commonly used for cadaver preservation.

**Modifying the Formaldehyde Formula**

Since the current way we embalm bodies is problematic, new formulas to make the embalming process less harmful need to be explored and implemented. Studies are being
completed in search of new cadaver preservation techniques, and one particular study done by Khouri (2012), using a minimal amount of formaldehyde, was very successful. The new formula introduced by Khouri contained much less formaldehyde than the current embalming mixture, at 0.5% vs a 5% concentration that is commonly used (Khouri, 2012). He claims that “this modified formula yields a high quality preserved cadaver with high flexibility and color presentation. A reduction of unwanted ambient hazardous toxic effects of formaldehyde and other chemical fumes was achieved” (Khouri, 2012, p. 32). During Khouri’s study it was also noted that “[a] significant percentile reduction was observed in all the symptoms that the students complained, especially with respect to the unpleasant smell and nasal, skin, and eye irritations when the new embalming formula was introduced” (Khouri, 2012, p. 34). As part of the test, the rooms containing the embalmed bodies were measured for formaldehyde readings. The cadavers embalmed with the old formula had readings up to 2.57 ppm, while one of the rooms that contained the new formula had no detection of formaldehyde whatsoever (Khouri, 2012, p. 38). Modified embalming formulas are available and effective, and should be introduced into the funeral industry.

Alternatives to Embalming

In North America embalming seems to be the standard method for body preservation; however, other options are available. Many people assume embalming is necessary, but in most cases that is simply not true. Funeral director Edith Froment explains that while the regulations vary between provinces, in British Columbia embalming is legally required only when the body is leaving the province (personal communication, June 18, 2014).

Freezing
Chiappelli & Chiappelli (2008) found that “[f]reezing is the most viable alternative for preventing decomposition in the short term. It preserves the body in a way that does not require toxic chemicals” (p. 26). Iserson also argues that “other alternatives that preserve the body and prevent odors include packing the body with dry ice and placing the body in a waterproof pouch with lime” (as cited in Chiappelli & Chiappelli, 2008 p. 27). Both of these methods are intended for short term use. By continuing to use the current embalming standard for cadaver preservation, funeral workers, medical students and the environment will continue to be exposed to formaldehyde. Quality cadaver preservation can be done without the use of this toxic chemical.

**The Environment and Embalming**

Formaldehyde should also be banned due to its harmful effect on the environment. Most modern day cemeteries are well kept and aesthetically pleasing, but beneath the manicured lawn lays a toxic wasteland of formaldehyde. In the United States alone, two million people are embalmed every year, leading to approximately seven million gallons of formaldehyde being buried (Chiappelli & Chiappelli, 2008). Concerned mainly about the embalming process, Harker claims that “[c]ontemporary funeral practices and cemeteries are ecologically problematic. Digging in a modern cemetery in the United States is much like digging through a toxic waste site” (Harker, 2012, p. 151). He goes on to say that in North America it is common for a body to be embalmed with formaldehyde, placed in a casket made of hardwood and/or steel that is placed in a vault consisting of steel and reinforced concrete. After the burial, cemetery workers maintain the grounds by using excessive amounts of water and fertilizer to keep the grass looking pristine (Harker, 2012). The pollutants from the formaldehyde, casket, vault and fertilizer will over time leach into the groundwater.
Green Burials

The terms ‘conservation, natural or green’ burials are almost unheard of in North America, where the concept of a ‘traditional’ funeral is dominant. A conservation burial can be described as “using a biodegradable casket [such as bamboo] without a vault for burial and no embalming fluids in the body” (Harker, 2012, p. 154). Contrary to the traditional cemetery, a conservation burial does not introduce contaminants into the environment, and allows for plants and wildlife to flourish naturally. The common manicured look of the modern day cemetery is replaced with a more natural, ecological image of trees, bushes and plants. Harker (2012) explains that by eliminating the embalming process before burial, the cadaver is returning nutrients to the land, rather than causing further destruction that a traditional burial will do. Conservation burials not only honor our loved ones, but honor the health of funeral workers and the environment. Funeral homes need to offer conservation burials, because the overall exposure of toxic chemicals will be significantly reduced.

Conclusion

After researching the effects of formaldehyde and embalming, it is certain that new methods of body preservation must to be put into place for the safety of funeral workers, medical students and the environment. The current use of formaldehyde for cadaver preservation is unnecessary, as nontoxic options have been proven to be just as effective. We need to embrace new embalming practices or eliminate the process altogether by offering conservation burials, where the environment is not jeopardized by the mass burial of formaldehyde. It is imperative that the funeral industry take responsibility for implementing these much needed changes and by doing so, the health of the public and the environment will be richer.
References


Khoury, N. (2012). Management of chemical health hazard fumes emitted during and after embalming procedure and its impact on medical students and embalmers. *Civil & Environmental Research, 2*(8), 32-40. doi: 9766AH249/44-87T