The Tibetan medicine compound Tsotel: safety and efficacy Vol. 10(1) pp 1-5, February, 2019
DOI: http:/dx.doi.org/10.14303/irjps.2019.001
Available online http://www.interesjournals.org/IRJPS

Short Communication

The Tibetan medicine compound *Tsotel*: safety and efficacy

Tashi Rabten

China University Political Science Law, 25 Xitucheng Rd, BeiXiaGuan, Haidian Qu, Beijing Shi, China

***Corresponding e-mail:** rabten@me.com

ABSTRACT

A class of complex Tibetan pills commonly called precious pills, or *rinchen rilbu* in Tibetan, is a compounded Tibetan formula combining dozens of minerals and herbs. *Tsotel* (*btso thal*), the key medicinal compound in precious pills, synergizes with the other herbs and minerals in each formula and is used to treat strokes, inflammation, chemical poisoning, such as anthrax, neural disorders and diseases arising from various toxicities. Tibetans have used these medicines for at least two thousand years. However, since the medicinal compound of *Tsotel* includes minerals such as gold, iron, and especially mercury, some scholars and physicians have toxicity concerns surrounding *Tsotel* administration. Thus, elucidating the traditional process of compounding this medicinal substance will improve our understanding of *Tsotel*'s safety and efficacy.

Keywords: Tibetan compound pill, purified mercury, minerals, safety and efficacy

INTRODUCTION

Tsotel is a term in Tibetan language in which *tso* (*btso*) refers to cooking or melting and *tel* (*thal*) to an 'ash' or 'gray' substance. The term refers to the mercury detoxification procedure named after the medicine itself. This procedure is the result of an ancient quest for a drug that can counteract all poisons (Gerke, 2013).

In the traditional process, *Tsotel* is hand-manufactured through complex procedures to detoxify the mercury and fuse it with various mineral and herbal compounds. Since raw mercury is toxic, if the mercury detoxification procedure is not properly completed, the final medicinal formulation will lead to mercury toxicity. The mercury detoxification procedure is long and arduous, requiring many steps over several weeks and with several dozen physician-pharmacists involved in its compounding (Gerke, 2013).

The procedure begins with obtaining pure quality raw materials, a critical step for conducting detoxification. Detoxification requires the addition of sulphur, acids and other herbs, which are variably melted, cooked and cooled according to strict protocols and repeatedly refined until the mercury toxicity, as well as all toxicity in the other metals, minerals and herbs, is removed (Gerke, 2015). *Tsotel* is a critical ingredient in some of the most treasured Tibetan medicines.

According to the Men Tsee-Khang at Tibetan Medical & Astrological Institute, India there are eight commonly used precious pills that use *Tsotel* to direct their activities and enhance their efficacies toward the particular diseases and physiological systems on which they act. Few of them are, *Rinchen Drangjor*, *Ratna Samphel*, *Jumar 25* and *Yu-nying 25* (Gerke, 2013). Each of these pills uses differential amounts of *Tsotel* to achieve their treatment efficacies. These formulas are commonly used to treat stroke, high blood pressure, heart disease, joint conditions, gout and inflammation (Category Archives: Tibetan Medicine, 2018).

The synthesis of *Tsotel* requires a clean manufacturing environment, high quality ingredients, and proper equipment. The most important step is following the traditional procedures for making *Tsotel*, which include making *Tsotel* at the correct time of year, date, and time as well as ensuring that the manufacturers have the proper and trustworthy lineage to make it. The quality of the *Tsotel* produced is highly sensitive to all of these conditions. Missing any one of these

conditions results in a product that is likely not medicinal and is potentially toxic and harmful.

A recent study by Liu et al., 2018 makes gross assumptions, does not engage rigorous scientific criteria, and thus led to unfounded conclusions. Liu's team claimed that the mercury and methy-lmercury found in Lhasa municipal sewage are due to Tibetan medicine consumption, yet they did not demonstrate evidence that raw mercury and methyl-mercury are found in Tibetan medicine nor that sewage is the source of this environment pollution in Tibet.

Moreover, since many Tibetan medicine pharmaceutical companies are now owned by Chinese entrepreneurs, many likely do not follow traditional procedures, including quality control and spiritual processing. Recently, a well-known Tibetan Buddhist scholar Khenpo Tsultrim Lodro emphasized how a great number of Tibetan medicine manufacturers are now Chinese-owned and, by not following traditional processing procedures for Tibetan formulas, are detrimentally influencing the global reputation of Tibetan medicine (Tamdin and Rigpa 2019).

In a study conducted by Sarah Sallon et al., 2016) at the Tibetan Medical & Astrological Institute in India, patients those consumed *Tsotel*-containing precious pills did not show signs of mercury toxicity.

The author doubts whether the Liu team properly assessed *Tsotel* manufactured under traditional procedures or its administration to patients under the guidance of a physician. A growing body of literature conducted by researchers all over the world has demonstrated that *Tsotel* is free of toxicities and chemically stable (Gerke, 2013; Salon et al., 2006).

HISTORY OF *TSOTEL* DEVELOPMENT

During the 4th century, Nagarjuna, known as Phakpa Ludrub ('phags pa klu grub) in Tibetan and considered one of the founders of Tibetan Buddhism, was one of the first to use a form of mercury as medicine (Pierce and Salguero, 2017). Tibetans consider Phakpa Ludrub as one of the founding Buddhist masters as well as a great healer and founder of the lineage of medical practice in Tibet. He experimented with various metals as compounds and developed methods to distinguish the various subtypes and transmutations. He developed theory and practice for facilitating solvent and solute relationships; through these investigations, he found that mercury could dissolve all metals. Phakpa Ludrup invented the processes of "distillation" and "calcinations" after he discovered that black sulphide of antimony can convert most metals into ashes.

In the 8th century, Buddhism was first entering Tibet, and with it came its associated medical systems and technologies. Yuthok Yonten Gonpo (g.yu thog yon tan mgon po), the Tibetan medical master who composed the Four Medical Tantras (rgyud bzhi), the foundational text for the Tibetan medical tradition, was one of the first Tibetan doctors to utilize mercury detoxification in the Tibetan medical system (Czaga 2015). Yuthok Yonten Gonpo drew upon a teaching lineage originating from Phakpa Ludrup in a process now called Ngьlchu Tsodru Chenmo (dngul chu btso bkru chen mo) in Tibetan, or the Great Mercury Detoxification. It has also been called the Great Accomplishment.

Tibetan materia medica usually comes from plants, minerals and metal sources, all of which must be evaluated to ensure that a product meets the highest standards of identification, condition, strength, quality and purity at the time of use. A traditional manufacturing facility uses an integrated systems approach, drawing upon the quality of equipment, skill, and production packaging. Established quality control procedures are used to monitor output and to validate manufacturing procedures that could cause variability in production and quality. The physician-pharmacist must have all the proper educational and training qualifications as well as traditionally conferred lineages to conduct this process.

TIBETAN FORMULATION PROCESSING

Tibetan medical theory of the body is based on the functional activities of three constitutional energetic systems, called nyйpa (nyes pa), that sustain life. The three nyйpa are rlung (rlung, pronounced 'loong'), tripa (mkhris pa), and bйken (bad kan). When these three constitutional energetic systems are balanced, they provide the body with all of its functional capacities. The three nyйpa also have associations with the five elemental dynamics of earth, water, fire, wind and space. According to the Four Medical Tantras, rlung is characterized by the wind elemental dynamic, tripa by the fire dynamic and bйken by the earth and water dynamics (Schrempf, 2015).

These five elemental dynamics share characteristics with the human body as well as the natural environment and, in the case of medicine, its constituent plant and mineral components. The Four Medical Tantras clearly state that: The human body was created by the five elements, as disease is also driven by the five elements at the same time; medicine is characterized by the five elements. Therefore, the human body and its medicine are virtually comprised by the same ground itself.

Disease occurs when the body's constitutional energy has lost its balance. Identifying disease begins with the principle of identifying excess ('phel), deficiency (zad) and abnormal conditions ('khrugs) of the three constitutional energetic systems.

Treatment methods aim to counteract imbalances using natural resources, such as complex formulas of herbs and minerals to regulate the body's disturbances. For example, excess ('phals) is treated by reducing components in excess; deficiency (zad) is treated by increasing and tonifying deficient components; and abnormal conditions ('khrugs) are treated by regulating these disturbed functions and components into normal activity, degree and flow.

Tibetan medicinal formulations include plant, herbal and mineral ingredients. Tibetan medical physicians use compounding principles and human intuition to formulate medicines. Compounding principles draw upon the properties by which materia medica are classified, namely: the six tastes, eight properties and seventeen effects. These properties are delineated as follows:

- The six tastes are sweet, sour, salty, bitter, acrid, and astringent;
- The eight potencies are heavy, oily, cool, soft, light, rough, acrid, and sharp; and
- The seventeen effects are cold, heating, warming, cooling, thick, thin, moist, rough, light, heavy, steady, motive, blunt, sharp, tender, dry and soft (Dolma, 2013).

An example of an important medicinal ingredient in Tibetan medicine is *Chebulic myrobalan* (*Terminalia chebula*), known as *arura* (*a ru ra*) in Tibetan, because it exhibits a majority of the properties of each of these categories and is used in many Tibetan medicine formulations.

In Tibetan medicine, treatment involves dietary and behavioural advice, medication and external therapies and procedures. This comprehensive approach is critical in treating disease across the full spectrum of conditions because many diseases might not require invasive procedures and might simply respond to dietary and lifestyle adjustments. Patients often learn that the healing process is not only the doctors' responsibility; rather, patients themselves have a role in affecting the healing process. Therefore, in Tibetan medicine, we generally approach treatment by first considering diet modifications and gradually considering the application of external therapies and surgical procedures as a last resort.

TSOTEL PROCESSING

The detoxification of mercury for medicinal use is one of the essential procedures in developing Tibetan medicine formulations. The procedure is a unique method, involving the taming of minerals; separating, sectioning, filtering, diverting, slicing, cleaning, washing, and rinsing substrates; mixing with a *khenda* (*khan Ta*) or syrup decoction; raising the temperature; and rubbing, frying, burning and boiling the final compounds (Czaja, 2013).

The ideal time for making *Tsotel* is March since, as in Tibetan tradition, March is associated with good fortune and healing. In terms of proper equipment for making *Tsotel*, physician-pharmacists require precise weight measuring devices; clean grinding implements, such as stone mortar and pestles; and clean processing equipment for mixing, triturating, heating, and stirring ingredients. Substandard equipment can create final products that do not fully detoxify substances and create compounds unsuitable for administration to patients.

The ingredients of *Tsotel* include small amounts of various metals and minerals, such as zinc, calcium, sulfur, and copper, as well as even smaller amounts of silver, coral, iron, magnesium, phosphorus, and raw mercury. Herbal ingredients include ginger (*Zingiber officinale*), long pepper (*Piper longum*), and cinnamon (*Cinnamomum verum*). The primary ingredient of mercury undergoes a highly intensive process where it is ground, cooked (both fried and boiled), immersed in other ingredients, filtered, and cleaned in order to form a compound absent of toxic properties. All steps of the process must be overseen by a qualified traditional Tibetan pharmacist who performs this entire procedure by hand. The processed mercury is immediately mixed with ginger powder and stirred (these days by machine) for several days before it is filtered and rinsed with scalding water to extract the solid clumps of mercury that have hardened clumps of ginger packed around them. The extracted mercury is then left to dry in the dark before it is once more removed.

The extracted mercury is rubbed with sea salt, black salt, and magnesium before it is once again cleansed with scalding hot water. Sodium bicarbonate and peach oil are then used to cook the mercury for several hours, and the mercury mixture is then run under hot water again to sift out the solid mercury clumps. The mercury clumps are immersed in barley alcohol (*chang*) for several days and then extracted and run under hot water once more. Next, various oils, such as almond oil, are rubbed over the mercury clumps. It is important that the mercury not be left exposed in its raw form in order to ensure that its transmuted form is absent of toxicity. Raw mercury left uncombined and uncompounded will immediately return to its toxic state.

This entire procedure typically takes close to a month. The sign that the complexed mercury compound has completed its transformation to a detoxified form is that the raw mercury-like color has changed to a dull green. Likewise, its properties have changed since it no longer flows freely in liquid form. The now fully processed, complexed mercury substance is mixed

with calcium sulfate and mustard oil and cooked again for approximately 72 hours, whereupon one can notice the complexed mercury substance and calcium sulfate forming an ash-like compound. This ash-like compound is the final product, *Tsotel*.

THE MEDICINE BUDDHA MANTRA

Tibetan medicine practitioners recite prayers to the Medicine Buddha and the Medicine Buddha mantra in order to empower medicine and the practitioners. In Tibetan Buddhism, the Medicine Buddha is the supreme healer. The Medicine Buddha safeguards all sentient beings from bodily and mental illness. The Medicine Buddha chant is also a potent practice to cultivate mindfulness in both practitioners and patients. Tibetan physicians usually visualize themselves as the Medicine Buddha and chant the mantra during healing or the making of medicine as a protocol for Tibetan medical practice.

The Medicine Buddha's short mantra is as follows:

TADYATHA OM BHEKANDZYE BHEKANDZYE MAHA BHEKANDZYE BHEKANDZE RADZA SAMUGATE SOHA.

CONCLUSION

Tibetans have practiced their own traditional medicine for over a thousand years. Treatments for stroke, inflammation, neural disorders and various toxicities are commonly found in Tibetan medicine and demonstrate good results. One special class of formula in Tibetan medicine is called precious pills, known as *rinchen rilbu* in Tibetan and is formulated with dozens of minerals and herbs. The main compound in *rinchen rilbu* is *Tsotel* (*btso thal*). *Tsotel's* primary ingredient is a small amount of mercury. This initial ingredient has generated concern for its toxicity due to the assumption that the final form of the chemical structure is identical to raw mercury. However, consistent with a growing body of pharmacological work, the tradition has described that the composition of the final chemical transforms into a complex mercury sulphide due to heavy processing. Likewise, thousands of years of administration of *Tsotel* to patients have demonstrated that toxicity is not an issue. However, in the modern economic world where pharmaceuticals contemporary and traditional are geared for profit, rather than human well-being, many entrepreneurs now possess their own Tibetan medicine manufacturing plants that lack both the quality and integrity of proper processes. As such, many of these manufacturers fail to follow the traditional procedures and fail to procure proper high-quality ingredients for making *Tsotel*, with potential results in toxicity, danger for human consumption, and counterfeit Tibetan medical products. As such, I have outlined the proper traditional process of making *Tsotel* in this article in order to highlight concerns in the Tibetan medical field of breaches in the tradition and lineage of making this critical compound for those who have benefited from Tibetan medicine historically and in the future.

ACKNOWLEDGEMENTS

Author acknowledges the support of Christina C Pratt from New York University.

CONFLICT OF INTEREST

The author of this article declares that there are no conflicts of interest or financial interests regarding the publication of this article.

REFERENCES

Category Archives: Tibetan Medicine (2018). My ALS Adventure–Tibetan Medicine. ALS, Buddhism, Tibetan Medicine.

Czaja O (2013). On the History of Refining Mercury in Tibetan Medicine. Asian Med 8: 75–105.

Czaja O (2015). The Administration of Tibetan Precious Pills. Asian Med 10: 36–89.

Dolma S (2013). Understanding Ideas of Toxicity in Tibetan Medical Processing of Mercury. Asian Med 8: 106-119.

Gerke B (2013). Editorial. Asian Medicine 8: 1-14.

Gerke B (2013). The Social Life of Tsotel. Asian Med 8: 120–152.

Gerke B (2015). Biographies and Knowledge Transmission of Mercury Processing in Twentieth Century Tibet. Asiatische Studien-Études Asiatiques. Walter de Gruyter GmbH 69: 867–899.

Liu M, He Y, Baumann Z, Yu C, Ge S, Sun X, Cheng M, Shen H, Mason RP, Chen L, Zhang Q, Wang X (2018). Traditional Tibetan Medicine Induced High Methylmercury Exposure Level and Environmental Mercury Burden in Tibet, China. Environ Sci Technol 52: 8838–8847.

Pierce C, Salguero (2017). Buddhism and Medicine: An Anthology of Premodern Sources. Columbia University Press, Ney York, USA.

Sallon S, Namdul T, Dolma S, Dorjee P, Dolma D, Sadutshang T, Ever-Hadai P, Bdolah-Abram T, Apter S, Almog S, Roberts S (2006). Mercury in traditional Tibetan medicine–panacea or problem. Hum Exp Toxicol 25: 405–12.

Sallon, S, Dory Y, Barghouthy Y, Tamdin T, Sangmo R, Tashi J, Yangdon S, Yeshi T, Sadutshang T, Rotenberg M, Cohen E, Harlavan Y, Sharabi G, Bdolah-Abram T (2016). Is Mercury in Tibetan Medicine Toxic? Clinical, Neurocognitive and Biochemical Results of an Initial Cross-Sectional Study. Exp Biol Med 242: 316-332.

Schrempf M (2015). Contested Issues of Efficacy and Safety between Transnational Formulation Regimes of

Tibetan Medicines in China and Europe. Asian Med 10: 273–315.

Tamdin T, Rigpa S (2019). “Precious Pill” Publication in Precious Pill, accessed at: https://www.men-tsee-khang.org/medicine/pills.htm.