

## A Review on Traditional Ayurvedic Preparations Containing Gold

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*Received: 20<sup>th</sup> May, 17; Revised 3<sup>rd</sup> June, 17, Accepted: 15<sup>th</sup> June, 17; Available Online: 25<sup>th</sup> June, 2017*

### ABSTRACT

The gold and its preparations are used from the ancient time throughout the world for many purposes. In Ayurveda gold is having great importance for its utilization in many pathological conditions as a therapeutic remedy. The present review enlightens some of the gold preparations were practised in Ayurveda like Swarna lehan, Swarna bhasma, Suvarna bindu, Suvarna Vacha, Kumarabharana Rasa and Swarnamrita prashana. We focused on their traditional method of preparations, therapeutic potential and limitations along with the future prospectus. There is a need of further studies for paying attention towards the use of gold and its preparations in the modern era.

**Keywords:** Gold, Ayurvedic preparations, Therapeutic Potential.

### INTRODUCTION

Natural health care system was originated in India more than 5000 years ago. Its main objective is to achieve optimal health and well-being through a comprehensive approach that addresses mind, body, behaviour and environment. It emphasizes prevention, health promotion, and provides treatment for many diseases as well as disorders. In Ayurvedic Samhitas there are descriptions of various tonics or immune boosters that build up the child's strength to fight against diseases and its complications. These tonics also provides supplementary nutrition and they also enhances the child's intelligence and learning of new skills such as speech. The substance which promoting the health or relieving the ailment is considering as a medicine in current scenario. At present, we are having information on natural drugs for about 10% only there are about more than 90 % of natural drugs which are need to be evaluated to know their medicinal properties and therapeutic potential if any. Along with these natural drugs, early physicians were supposed to use some minerals and metals in their practice in the form of tonics. The usage of metals and minerals has been well-known to mankind since thousands of years. One of those substances is GOLD (swarna/suvarna) having Chemical formula- Au and Atomic number- 79 belongs to Group – 11 and Atomic mass 196.96655. Gold has been given the status of the most precious metal, which was used to prepare sculptures of Gods, ornaments, coins and so on, all over the world. It is one of the most ancient metals even used for preventive and curative purposes. With regards to its early knowledge to Indians, an earliest reference is found during prehistoric period, mentioned as Hiranya (synonym with Swarna) in Vedic works<sup>1-2</sup>.

Gold is one of the most non-reactive metals known to mankind till date<sup>3</sup>. It will not impart any harmful effect on human body and will lie inert<sup>4</sup>. As per Ayurvedic system

of medicine it has been found that gold is used both externally and internally for therapeutic purposes. Externally Swarna dharana (wearing of gold ornaments) is considered pious and mainly use in grahabadha. Internally it is either in the form of rubbed gold (Vidhrisya dhoute drishadi), incinerated gold or Swarna Bhasma, Swarna Lavana (Described in Rasatarangini) or swarna vark (Mostly used in Unani system of medicine)<sup>5</sup>. Kashyapa opines that feeding of gold increases intellectual properties, digestive and metabolic power, strength, gives long life; it is also known to be auspicious, virtuous, and aphrodisiac. It increases complexion and eliminates the evil effects of grahas. Further it has been mentioned that consumption of gold in either form mentioned above for one month to the child leading to improvement in his/her intellectual properties, unaffected by the diseases. Similarly if the same treatment extends for six months, child will able to retain what-so-ever he/she heard, observed and taught. Sushruta and Vagbhat have prescribed gold along with various drugs to the newborn immediately after birth<sup>6-7</sup>. The drugs prescribed by Vagbhat is advised to be given through spoon made of gold<sup>8</sup>. The basic concept of this gold licking is entirely different as it is used only once in Jatakarma Samskara performed just after birth<sup>9</sup>. Gold is one of the noble metals being used in continuity to increase the vitality and immunity<sup>10</sup>. Some tonics mentioned in ancient Ayurvedic texts are as follows,

Swarna lehan  
Swarna bhasma  
Suvarna bindu  
Suvarna Vacha  
Kumarabharana Rasa  
Swarnamrita prashana  
*Swarna lehan*

The procedure to Swarna Lehan, is described in Kashyap Samhita in much detail. It is mentioned that, keeping face towards east, gold should be rubbed on a washed stone with a little quantity of water. Then it should be churned with Honey and Ghrita and should be given to the child for licking<sup>11</sup>. It is helpful for bulding immunity and cognitive power of the child.

#### Swarna bhasma

It Contains Swarnabhasma 10 mg, vacha ghana 2 gm, kushta ghana 2 gm, cow's ghee 5 gm, honey 25 gm.<sup>12</sup>.

#### Swarn Bhasma preparation and ingredients

It is prepared from purified Gold. There are many different methods of preparation. Any one method can be used. Here is one such method. Purified Gold leaf is ground with lemon juice, and applied with a paste of Rasasindhura (Mercurial compound). It is kept in a closed container, heated in absence of air in 400 – 500 degree Celsius for 4 -5 hours to get Gold Bhasma.

#### Swarna Bhasma dosage

The dose of Swarna Bhasma, as explained in text book is – 1/8 – 1/4 Ratti. 1 Ratti means 125 mg. So, dose is 15 – 30 mg per day. The pediatric dose – From infancy to 5 year old is 5 mg per day. From 5 – 10 years – 10 mg per day. From 10 – 16 years – 15 mg per day (Adjuvant used are Milk, honey or ghee). It is available in capsule form also. Each capsule contains 50 mg of Svarna bhasma. While taking Swarna Bhasma, Bael fruit should not be taken.

Health benefits of swarna bhasma: Swarna bhasma promotes Immunity through phagocytosis and found to be effective in motor neuron disease in small dose<sup>13</sup>. It relieves burning sensation, if taken along with bile of fish. It gives aphrodisiac effect if taken along with Bhringaraja (*Eclipta alba*). It improves strength and immunity, if taken along with milk. It is good for eyes, if taken along with Punarnava (*Boerhaavia diffusa*). It improves memory if taken along with sweet flag. It improves skin complexion if given along with saffron. It acts against poison, if given along with an herb called Nirvisha. It relieves psychosis if given along with ginger, clove and pepper. It is a natural aphrodisiac, cardiac tonic, immune booster and heavy to digest. It has scraping effect. It improves intelligence, memory, and speaking capacity. It is used in treatment of Malabsorption syndrome, Dyspepsia, Hiccup, Anaemia, Dyspnoea, Asthma, Fever, Tissue wasting, Tuberculosis, Impaired intelligence, Epilepsy, Rupture / weakness of ligaments, Heart disease, Disease due to Vata dosha, Syphilis, Poison, Loss of memory, Mania, Psychosis, Hoarseness of voice, Diseases of skin, Tuberculosis, Senility/Progeriasis. Brings out quickly the colour and beauty of the body. This restores the sexual power lost through excessive indulgence or old age. Its efficacy in skin ailments and syphilis is exceptional. This is specially prescribed in hemiplegia and complete paralysis<sup>14</sup>.

#### Preparation of Suvarna bindu (Gold drops)

Traditionally Shuddha Suvarna has been advised to be rubbed on a rubbing stone with water and then emulsified with madhu and ghrita to achieve a fine colloidal suspension. Ghrita fortified with Medhya and Rasayana herbs like Brahmi (*Bacopa monnieri*), Mandookaparni (*Centella asiatica*), Yashtimadhu (*Glycerrhiza glabra*)

Shankhpushpi (*Convolvulus pluricaulis*), Vacha (*Acorus calamus*) and Guduchi (*Tinospora cordifolia*) are commonly used in Suvarnabindu preparation by clinicians expecting enhanced immunomodulatory and nootropic effects of Suvarnaprashana in children.

Following are some of the widely used ratios for preparation of Suvarnabindu.

2.4 gm. of Suvarna Bhasma is added to 250 ml of honey and 250 ml processed ghee. Individual Doses: 100mg Suvarna bhasmais added to 6 ml of processed ghee and 6ml of honey is kept separately. Honey is mixed with ghee just before the administration<sup>15</sup>.

#### Suvarna Vacha

Suvarna Vacha which is purified gold wire inserted into processed underground stem (dry or fresh) of Vacha (*Acorus calamus*) is yet another unique formulation which is popularly used for giving Suvarnaprashana. Suvarna vacha is rubbed on a clean rubbing stone (5-6 rotations) with milk or water, so as to get fine gold particles along with a paste of vacha. This is then mixed with equal amounts of Ghee and honey and used for Suvarnaprashana. Suvarnavacha uses metallic gold as opposed to calcinated gold which is used in Suvarnabindu. The one special benefit of suvarnavacha is improvement of speech<sup>16</sup>.

#### Kumarabharana Rasa

Kumarabharana Rasa is an Ayurvedic compound drug comprising of Bhasmas (calx) of Swarna (Gold), Rajata (Silver), Pravala (coral) and Choorna of Yastimadhu (*Glycyrrhiza glabra*), Amalaki (*Embllica officinalis*), Ashwagandha (*Withania somnifera*), Shunti (*Zingiber officinale*), Pippali (*Piper longum*), Haritaki (*Terminalia chebula*), Vacha (*Acorus calamus*) and all these drugs given one Bhavana with Swarasa (extract juice) of Guduchi (*Tinospora cordifolia*), Brahmi (*Bacopa monnieri*) and Tulsi (*Ocimum tenuiflorum*) separately.

Method of Preparation: Ingredients with Sanskrit and botanical name, form and proportion are detailed in following chart. Fine powder of Vacha, Pippali, Shunthi, Ashwagandha, Amalaki, Haritaki and Yastimadhu along with bhasmas of Swarna, Rajata and Pravala were taken and one bhavana (impregnation) with each of Guduchi swarasa, Brahmi swarasa and Tulsi swarasa was given. Tablets of 500 mg each are usually prepared and one tablet is administered once daily morning in empty stomach<sup>17</sup>.

Ingredients of kumarabharana rasa are given below,

Swarna -	Bhasma 1 part
Rajata -	Bhasma 2.5 parts
Pravala -	Bhasma 5 parts
Ashwagandha Withania somnifera -	Churna 40 parts
Amalaki Emblica officinalis	-Churna 50 parts
Shunthi Zingiber officinalis	-Churna 20 parts
Pippali Piper longum	-Churna 10 parts
Haritaki Terminalia chebula	-Churna 10 parts
Vacha Acorus calamus	-Churna 10 parts
Yashtimadhu Glycyrrhiza glabra	-Churna 50 parts

Kumarabharana rasa is mainly used in chronic tonsillitis, Also the anti-inflammatory, antioxidant, immunomodulatory, antibacterial, antipyretic, scraping, digestive stimulant, carminative, nourishing and

rejuvenative effects aids in the better prognosis of this disease<sup>18</sup>.

#### *Swarnamrita Prashana*

Besides Swarna bhasma, Medhya drugs like Amritha i.e. guduchi are added which meant to enhance the learning ability especially in children. It contains plant extractive mixed with ghee and honey and was given to lick<sup>19</sup>.

Preparation of swarnamrita prashana: Guduchi (*Tinospora cordifolia*), green stem kashaya (water extract) was prepared reducing to quarter. In 200 ml of guduchi kashaya, add 50 ml of ghee along with brahmi (*Bacopa monnieri*), vacha (*Acorus calamus*), jatamamsi (*Nordostyche jatamamsi*), Ashwaghandha (*Withania somnifera*), Shankpushpi (*Convolvulus pluricaulis*), yasthimadhu (*Glycerriza glabra*), Pippali (*Piper longum*), Maricha (*Piper nigrum*). 1.0 gm powder of each & 50 ml of honey were added to this Ghrita and triturated. To maintain the consistency, the bowl of swarnamrita prashana kept in hot water. This preparation was used as 3-4 drops to children using dropper<sup>19</sup>.

#### *Use of swarna (gold) in paediatrics as Swarna Prashan*

The term Swarnaprashana was coined by Acharya Kashyapa. Suvarna prashan sanskar is one of the 16 essential rituals described in ayurveda for children. It is the process in which Suvarna bhasma (purified ash of gold) is administered with fortified ghee prepared with herbal extracts, and honey in liquid or semisolid form. Suvarna prashan can be given to age group of 0-16yrs daily early in the morning, or at least once in a month that is on the day of Pushya nakshatra- an auspicious day according to Indian tradition which happens to come after every 27 days of no moon day, there is a saying that practicing swarna prashan on this day will be bestows excellent benefits. In literature it is saying that Swarna prashana develops medha (mental ability), agni (digestive power), bala (strength), aayu vardhana (prolonged life span), it is also Mangalakara (brings in good virtues in child, positive attitude in life, optimism, power to overcome mental and physical hardships, good fate), Vrushya (attractive nature and personality), Varnya (tones skin colour), Graha baadha nashaka (voids away associated evils). If swarna prashana is done regularly for 1 month then child becomes extremely intelligent and remains unaffected by any infective diseases, if taken for 6 months regularly then child will be (shrutadhara) excellent in grasping<sup>20</sup>. This precise mention may also be due to some specific action of gold in that age group of children, which is observed in the following studies. In a study, trace elements including gold were measured in human placenta and new born liver at birth. A trace elements like zinc, copper and gold were measured in the hair of new born infants<sup>21</sup>. In a study measuring trace elements in endometrium and decidua, looking for cyclic variations, including those during pregnancy, gold was found in human endometrium and decidua also. The reported levels of gold were slightly lower around mid-cycle than at other stages of the cycle<sup>22</sup>. In male reproductive system, gold was measured in semen and reported that it is the richest source of gold reported in biological materials<sup>23</sup>. Another study suggests a significant stimulatory effect of gold chloride on female reproductive

activity in immature rats<sup>24</sup>. Texts from Ayurveda have copious references describing the use of gold metallic powder (probably fine gold dust) or Suvarna bhasma in various rejuvenative therapies. Gold in the form of fine gold dust, red colloidal solution, Swarna Patra, Swarna Bhasma, Swarna Parpati, Kharaliya (triturated) formulations and Sindoorkalpa, often combined with ghee, honey, Medhya and Rasayana herbs were popularly used in the Ayurveda therapies<sup>25</sup>.

Acharya Sushruta cited administration of Swarna along with honey and ghee in one among the procedures of Jatakarma Samskara that is as a single dose at birth in the procedure of new born care. He provided the rationale behind this practice that there may be no adequate secretion of breast milk for the first 4 days after delivery and so as to support the baby with respect to preventive and nutritive aspects such practices were indispensable<sup>26</sup>. Acharya Vagbhata advises to give a combination of herbal drugs in a specific shaped spoon as that of the leaf of holy banyan tree, made up of gold to the newborn for increasing Medha (intellect)<sup>27</sup>. Administration of Swarna along with other herbs is also mentioned by Acharya Vagbhata in Jatakarma Samskara<sup>28</sup>.

There is misconception among the common man that, Suvarnaprashana is vaccination method in Ayurveda, because majority of the physicians administer it monthly once on the day of Pushya Nakshatra. But it is incorrect because Suvarnaprashana is a Rasayana Chikitsa which can be administered continuously to get the optimum therapeutic effects for the physical, mental, intellectual and spiritual wellbeing of the children. Suvarnaprashana can be given from birth to sixteen years, keeping in mind the rapid growth and development during this phase of life. Some practitioners advise it only up to 12 or 14 years. Clinically, a minimum therapy of 6 months, 1 year to two years is recommended in order to get considerable results. Experienced Vaidya says that, administration of Suvarnaprashana just on the day of Pushya Nakshatra (once in a month) does not provide significant health benefits. The best method is to give the low dose Suvarnaprashana (Svarna Bhasma less than 0.2mg per dose) for a period of 3 months. If this method is not possible, then Suvarnaprashana can be given for 10 to 12 days per month. Such 6-12 cycles should be repeated to get optimum health benefits<sup>29</sup>. Gold can also show its effects in adults also but might not in case of memory enhancing and immune boosting but in the view of other conditions like treatment of rheumatoid arthritis where it works as disease modifying anti-rheumatic drugs.

#### *Kinetics of gold particles*

Gold nano particles (GNP) enhance drug delivery system<sup>30</sup>. Exhibits surface plasmin resonance and ability to bind amine and thiol group allowing surface modification<sup>31</sup>. It is used as carrier in many drug delivery systems. Exemplified as a drug vehicle in centuximab and gemcitabine<sup>32-33</sup>.

#### *Traditional Therapeutic Potential of Gold*

Traditional gold preparations are attributed with rejuvenating and antioxidant properties. Earlier studies revealed analgesic, immunostimulant (in calcined form),

adaptogenic, glycogen sparing property, restoration of stress, and depression<sup>34</sup>. Bhasma (calcined form used in various ailments like T.B, Anaemia, cough, debility, infertility, muscular dystrophy<sup>35-36</sup>. It is considered best Rejuvenator, promotes longevity, and prevents aging<sup>37</sup>. As per the classical reference in ancient text of Ayurveda, Swarna Bhasma is prepared by Putapaka method. This method involves mainly three steps i.e Shodhan (Purification of gold to haul out physical impurities), Bhavna (wet grinding for reduction of particle size) and Maran (incineration for further reduction in particle size under temperature). These procedures of Bhavna and Maran are repeated several times on the metal. The incinerated matter is then well grinded and a brownish red powder i.e. Swarna Bhasma is obtained. Swarna Bhasma principally constituted globular gold particle of 56-57 nm and thus it is possible that these particles would reach the target site of action through blood after gastrointestinal uptake<sup>38-39</sup>. The classical descriptions of Suvarna Prashana therapy uses metallic gold- rubbed on a clean rubbing stone with water, till fine gold particles are released. The rubbed gold or gold powder mixed with fine powder of Medhya, Rasayana herbs, ghee and honey is given to the new born. Rubbed gold in metallic form carries the risk of toxicity. Hence, a safer option of Suvarna bhasma is being used for the Suvarnaprashana now a days<sup>40</sup>.

#### *Ancient Therapeutic history of Gold*

In plastic surgery, gold has long been used. Patient under the skin type of microscopic threads of gold, which form a sort of "frame". After some time, around the base of gold increases collagen tissue, thus face tightens and rejuvenates. Even in the thirties of the last century with the gold began to treat diseases of the joints, rheumatoid arthritis. Improvement occurs in eighty percent of patients. Gold acts within the body as gold compounds, which are introduced into the body, inhibit macrophages to inhibit pathological immune responses. In order to identify patients who are at increased risk for side effects, scientists have worked for years to determine exactly how gold works in our cells. On one hand, gold helps to suppress your immune system when it is overactive on the other, gold can trigger an allergic reaction, which is an inappropriate immune response. While gold inhibits some immune cells that create inflammation, it simultaneously stimulates others<sup>41</sup>.

#### *External or ornamental gold*

Chains or bracelets worn on wrists perform the role of a closed circuit and have a particular effect on the human organism, the same way it happens when people wear wedding rings. Wedding rings have an effect upon the nerves of the third finger. The general characteristic of metals used for making chains or bracelets, usually gold or silver, is their ability to destroy structures. At that, metals can destroy negative information structures of people which is very good indeed. The wonderful qualities of gold explain why many years ago people chose this metal for making wedding rings. Gold stimulates the energy flow delivering energy to the urogenital system. And due to the anti-inflammatory action of silver, people began to make dishes, spoons and forks of silver to be less open to

infections. In studying the different uses of gold in the healing arts, we find that for thousands of years acupuncturists used silver and gold needles. It was said that gold is warm and stimulating while silver contains a cold, inhibiting factor. Every good acupuncture specialist has two sets of acupuncture needles made of gold and silver. When acupuncture is done with gold needles it gives anti-inflammatory action upon organs connected with points on the body. In case some organ is weak to function normally, an acupuncture doctor will offer performing acupuncture with a gold needle to stimulate the energy flow<sup>41</sup> Gold is warm and dilates the tissues and relaxes the injured area, permitting repair to be a little faster. Some kings and queens would wear a crown of gold on their heads or a gold band that would go around the entire head. In studying reflexology and acupuncture, you will find that the electrical meridians of the body are the electrical circuits of the body and are influenced by gold. Gold also can be used as a sort of jumper wire that allows the energy to go from one meridian that is normal and strong to one that is weaker and not functioning as well. It gives power to the weak or shocked meridians. Thus, it helps the body to heal itself in many respects.

#### *Rejuvenation of Skin*

Egyptians believed the healing powers of gold could cure all manner of physical, mental and spiritual ailments. Romans used gold preparations for treatment of skin lesions and sores. It is believed that Cleopatra wore pure gold for a radiant complexion. In ancient Chinese medicine, gold was the secret to youthful skin. Many luxury spas use 24-carat gold leaf treatments to hydrate, firm and moisturize the skin, claiming reduced fine lines and wrinkles and resulting in smooth and radiant skin. A news feed from the World Gold Council site reported a gold leaf facial treatment created in Japan declaring gold leaf put on the face naturally rejuvenates skin and reduce wrinkles. According to the creators of the treatment, gold locks in moisture and keeps skin firm by maintaining collagen in the skin and inhibiting the breakdown of elastin and also showed a significant improvement in mouth lesions and skin ulcers with no adverse reactions to gold leaf observed<sup>42</sup>.

#### *Treatment for skin disorders*

Gold is thought to have antibacterial properties and to help transport oxygen molecules into the skin for cell renewal to treat ulcers and inflammatory disorders of the skin. Some skin-healing benefits of gold were demonstrated by an in vitro chrysotherapy reported that gold is beneficial in treating autoimmune diseases and inflammation, and inhibits skin enzymes involved in blister formation<sup>43-44</sup>.

#### *Manifestations of utilization of gold and its preparations*

Allergic reactions to gold are rare but can result from direct skin contact. According to a publication in the "Daily News Analysis," some people display allergic skin responses to gold jewelry or dental crowns, says Dr. Thomas Fuchs of Goettingen University Hospital in Germany. After a survey of various dermatological clinics and hospitals, he concluded pure, unalloyed gold can trigger allergic reactions. The degree of allergy varies from immediate dermatitis on hands and feet from contact with

gold items to reactions only after many years of skin contact<sup>45</sup>. Chrysotherapy is a successful treatment for rheumatoid arthritis, but dermatological reactions to gold limit therapeutic usage. A study done at Tel Aviv Medical Center reported in "Annals of Rheumatic Diseases" was discontinued when patients given gold salts reacted adversely with symptoms including gold-induced skin rashes. After the study was stopped, coincidentally the patients with skin rash experienced remission in their rheumatoid arthritis. The patients without skin rash did not. Gold also alleviates arthritis and other inflammatory conditions by binding to specific proteins in your immune cells and interfering with the production of inflammatory chemicals. However, when gold attaches to these proteins, it alters their shape. This can prompt your immune system to recognize the proteins as foreigners, thus triggering an allergic response. In some cases, an allergic reaction to gold may not occur until you have taken it for a long time sometimes many months. Toxicity to gold compounds can develop in several of your organ systems. Oral gold preparations can cause diarrhoea. Gold allergy can be manifested by rashes, itching and reddened skin. Bone marrow suppression a side effect that can lead to anaemia, bleeding problems or infections is relatively common during gold therapy. Kidney and liver damage are also relatively common, so these organs functions must be monitored when you are taking gold. Any toxic reaction to gold mandates discontinuation of therapy and may require medical treatment<sup>46</sup>.

#### *Future scope of the various gold preparations*

Suvarna (gold) is known to non-reactive as well as one of the precious metals. Gold has appreciable properties in internally as suvarnaprashana samskar and externally as ornamental gold. The scope of Suvarnaprashana needs to be evaluated in Geriatric medicine as a preventive and palliative therapy for degenerative neurological disorders like Alzheimer's, dementia etc. It also needs to be evaluated as therapy in paediatrics for juvenile (Type-I) diabetes and early onset Type II diabetes. It is unique and one of the best examples of nanomedicine applied for preventive health care in Ayurveda. The efficacy and safety of Suvarnaprashana therapy entirely depends upon the quality of Suvarna bhasma, ghee and honey. Hence, standardized suvarna bhasma along with superior quality herbs, ghee and honey should be used for the preparation of Suvarnaprashana has a vast scope in achieving immunomodulatory, adaptogenic and nootropic effects in children, thus improving overall health and vitality of children at all ages. Also, the utility of Suvarnaprashana in geriatric medicine for prevention and control of neurodegenerative, senile disorders as well as for rejuvenation needs to be explored. Suvarnaprashana has an excellent scope as in boosting community health by ensuring healthy childhood. It needs to be popularized and promoted as a proactive and preventive therapy in society. Energies do exist; they do affect the body. Gold is precious, and its power and energy can be felt. Gold is more than just an expensive yellow metal. It has been exploited by physicians for decades to treat rheumatoid arthritis, asthma and a variety of other disorders. However,

gold's usefulness for many of these conditions has been limited by its toxicity, and until recently, gold has been largely replaced by more effective and less toxic drugs. According to the July 2011 issue of "Metallomics," gold is enjoying a renaissance as research unveils new potential uses, including treatment of some cancers. Gold has been used as an immune-suppressing drug for many years. Although it is now employed less frequently than in the past, new formulations gold nanoparticles, for example are being investigated for their utility in treating a number of conditions, including rheumatoid arthritis and cancer<sup>46</sup>. Today, gold leaf is used in the treatment and rejuvenation of skin conditions. The application of gold compounds to medicine, called chrysotherapy, reduces inflammation beneficial in the treatment of a variety of diseases, but this therapy often causes adverse gold-related skin reactions. According the technical treatise, the average person's body weighing 70 kilograms would contain a total mass of 0.2 milligrams of gold. The volume of this gold in purified form would be 10 nanoliters. If this refined gold were formed into a solid cube of purified gold, the measurement of each side of the cube would be 0.22 millimeters. By comparison, the human body contains 43 kilograms of oxygen, the most abundant element in the earth, as well as the human body. Other elements found in the human body include 16 kilograms of carbon and 7 kilograms of hydrogen. While the role of gold in the physiological processes of the human body was unknown for many years, it has recently been determined that gold plays a role in both the health and maintenance of the joints, as well as being a key element in the transmittal of electrical signals throughout the body. The human body contains 1.0 gram of Silicon. This element is commonly found in the presence of gold in nature and its metabolic function is currently unknown<sup>46</sup>. From the several years gold is valued not only as a precious metal. Its positive effects on the human body has proved Paracelsus. It was known in ancient times that gold is in a very low concentration in the blood of man, and it is active, indicating that the interaction between the metal and the human body. Gold normalizes metabolism, improves blood circulation, and has a strong bactericidal effect. It's no secret that the solution of radioactive gold has long been successfully used for the healing of cancer.

#### **CONCLUSION**

As per the extensive literature it can be concluded that gold and its preparations are having significant therapeutic potential in many diseases and pathological conditions but there is limited scientific data reported. It is a need of time that researchers, scientists and physicians should concentrate on this area for further studies so that the gold and its preparations can be utilised effectively as a therapeutic tool.

#### **CONFLICT OF INTEREST**

Authors are declare there is no conflicts of interest.

#### **ACKNOWLEDGEMENT**

The authors have contributed significantly in the design, drafting and revising the manuscript. The authors are also thankful to the SVKM's NMIMS, SPTM, Shirpur for providing necessary facilities and support.

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