

Mitigating Impact of Air Pollution on Public Health Through Ayurveda¹

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ABSTRACT

Ayurveda describes *vayu* as a *mahabhuta* (gross element) responsible for creation, destruction, controller as well as regulator of all creatures. As our existence and destruction depends on *vayu* still the *vayu* (air) is polluted by us. The characteristics features of polluted air are described in Ayurveda. Major causes of air pollution are automobiles, industries, domestic sources, smoking and miscellaneous. Air pollution has severe impact on atmosphere as well as living organisms. Ayurveda has very basic thought to control and purify the polluted air with the help of various procedures such as performing *yagya* as a purifier of external environment and *vamana* (emetics), *nasya* (nasal administration), *abhyanga* (massage), *vyayama* (exercise), *swedana* (sudation), *yoga* practices etc as a purifier of internal environment of body. The impact of *yagya* along with the mantra chanting is also described.

Keywords: air pollution; ayurveda; *vayu*

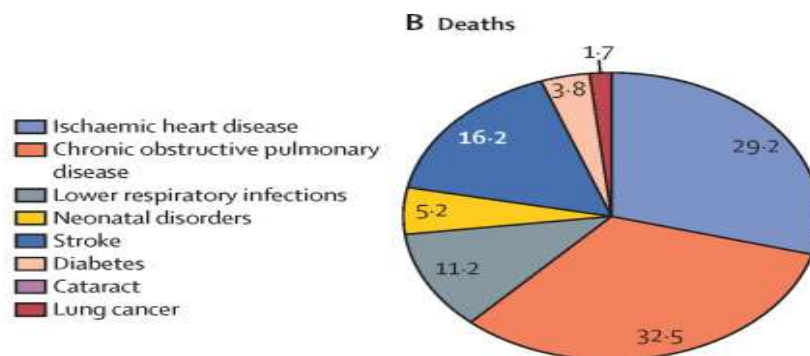
INTRODUCTION

The element air, called “*vayu*” in Sanskrit, is the second of the five primordial elements (*pancha mahabhutas*).ⁱ *Loka purusha siddhanta* (theory of resemblance) of Ayurveda is the *Pinda Brahmand Nyaya* of *Yajurveda* which explains the similarity of man with the universe. As per this principle, *vayu*; the universal entity is similar to the *prana* (life) in human beings.ⁱⁱ Thus the quality of the air in the external environment is must for the life of an individual. In current scenario, air pollution is one among the world’s largest health and environmental problem. It develops in two contexts i.e. indoor and outdoor air pollution. It is the need of today to overcome this problem as it leads to various health problems.

NEED OF THE TOPIC

Air pollution in India is a serious environmental issue.ⁱⁱⁱ Out of the 30 most polluted cities of the world, 21 were in India in 2019.^{iv} 51% of the pollution is caused by industrial emissions, 27% by vehicles, 17% by crop burning and 5% from other sources.^v The Global Burden of Disease Study of 2017 analyzed in a report by The Lancet indicated that 76.8% of Indians are exposed to higher ambient particulate matter over 40 microgram/m³, which is significantly above the national limit recommended by national guidelines on ambient air pollution. Exposure to particulate matter for a long time can lead to respiratory and cardiovascular diseases such as asthma, bronchitis, COPD, lung cancer and heart attack.^{vi} Asthma is the most common health problem faced by Indians and it accounts for more than half of the health issues caused by air pollution.^{vii} The below graph shows causes of death attributable to air pollution in India, 2019:^{viii}

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AIM AND OBJECTIVE

1. To review the *Ayurveda* provisions of management of the air pollution borne disorders in human beings.
2. To highlight special significance of *yagya* and *mantra chanting* for prevention of the air pollution.

MATERIALS AND METHODS

For this literature such as *Charak Samhita*, various *ayurvedic* literature and research articles have been gathered and reviewed.

Air

Ayurveda describes *Vayu* (air) as one of the *mahabhuta* responsible for the formation of the universe as well as the fetus in the womb of the mother. *Vayu* is responsible for the birth as well as death, as the controller, regulator and the lord of all creatures.^{ix} *Vayu* (air) is considered as the first one (*anadi*), the regulator of all actions and thoughts in the universe, subtle and omnipresent.^x The role of the natural *vayu* (air) which is moving in the universe is to sustain the earth, ignite the fire, bring compactness and the movement of the sun, moon, stars, planets.^{xi} Its function is to create the clouds, bring rain, flows the rivers, bringing sprouting of plants and maturity of flowers, plants and fruits.^{xii} *Atharvaveda* describes medicinal uses of *vayu* (air) as there is two types of wind one that is coming from ocean, is pure and promotes health and the other coming through the mountains and planes, is full of impurities and also not good for health.^{xiii} Modern science describes *Vayu* (Air) as the mixture of gases present in the atmosphere, which we breathe and which surrounds us, having properties like colorless, odorless, invisible, tasteless gaseous medium, and principal agent for the diffusion of light, heat and smell.^{xiv}

AIR POLLUTION AND ITS IMPACT ON HEALTH

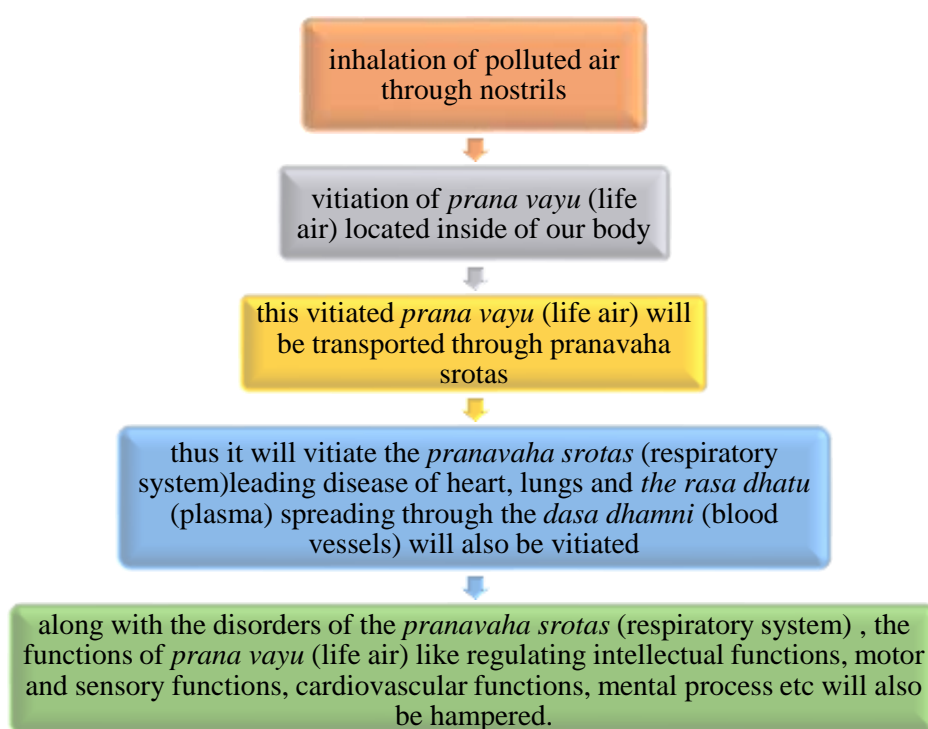
As the existence and destruction of all creatures depends on *vayu*(air) , still *vayu* (air) is polluted due to unrighteous acts by humans. The main cause of their unrighteous acts is their intellectual blemishes.^{xv} The characteristics of the abnormal *vayu* (air) present in the universe are breaking the peak of the mountains, uprooting the trees, disturbing the oceans, generation of earthquakes, causing thunderstorm in the clouds, disturbing the properties of the six seasons, non productivity of plants, spreading epidemics, removing the existing substances and can destroy all the four *yugas* by altering the cloud, sun, fire and wind.^{xvi} This abnormal *vayu* (air) is also one of the main cause of the spreading of epidemics leading to mass destruction of the people.^{xvii} The characteristics of the polluted *vayu* (air) responsible for spreading epidemics are air which is not in conformity with the seasons, totally calm or violently blowing, excessively rough, intense cold, intense hot, excessive dry, excessive humid, terribly clamorous, blowing from contrary directions and chasing with each other, violently spinning, associated with unwholesome odor, moisture, sand, dust and smoke.^{xviii}

In today's era the sources of the air pollution are:

- ❖ Automobiles: are the major sources of air pollution. They emit hydrocarbons, carbon monoxide, lead, nitrogen oxides and particulate matter in strong sunlight. Certain of these hydrocarbons and oxides of nitrogen may be converted in the atmosphere in to "photochemical" pollutants of oxidizing nature. In addition, diesel engines when misused or badly adjusted are capable of emitting black smoke.

- ❖ Industries: emit large amounts of pollutants in the atmosphere. Combustion of fuel to generate heat and power produces smoke, sulphur dioxide, nitrogen oxides and fly ash. Petrochemical industries generate hydrogen fluoride, hydrochloric acid and organic halides. Many industries discharge carbon monoxide, carbon dioxide, hydrogen sulphide and sulphur dioxide. Industries discharge their wastes from high chimneys at high temperature and high speed.
- ❖ Domestic sources: domestic combustion of coal, wood or oil is a major source of smoke, dust, sulphur dioxide and nitrogen oxides.
- ❖ Tobacco smoking: is the most direct and important source of air pollution affecting the health of many individuals. Even those who do not smoke may inhale the smoke produced by others (passive smoking).
- ❖ Miscellaneous: comprises burning refuse, incinerators, pesticide spraying, natural sources (e.g. wind borne dust, fungi, molds, bacteria) and nuclear energy programs contributes to air pollution.

The pathogenesis of air pollution borne disease can be:



Adverse effects on health due to air pollution:

1. Respiratory tract irritation, bronchial hyperactivity, impaired lung defenses, bronchialitis obliterans.
2. Lung cancer
3. Cough
4. Broncho constriction, decreased exercise performance, respiratory tract irritation
5. Asthma and COPD
6. Impaired neuropsychological development in children
7. Cardiovascular disorders

TREATMENT PROTOCOL OF THE AIR BORNE DISEASES THROUGH AYURVEDA

Ayurveda mentions three kinds of treatment modalities- *Daivavyapashraya* (divine or spiritual therapy), *yuktivyapashraya* (therapy based on drugs & logical reasoning) and *satvavajaya* (psychotherapy).^{xix} Let us see the role of each treatment modalities for prevention and treatment of the diseases produced due to air pollution.

❖ *Daivavyapashraya cikitsa* (divine or spiritual therapy)

It includes *mantra* chanting, medicine, wearing gems, auspicious offerings, offerings to sacred fire, chanting of auspicious hymns, visit to holy places etc. Performing *yagya* is the best remedy to mitigate indoor as well as outdoor air pollution. Various ingredients such as Jow (*Hordeum vulgare*), Til (*Sesamum indicum*), Kismis (*Vitis vinifera*), Nariyal (*Cococ nucifera*), Chandan (*Santanum album*), Deodara (*Cedrus deodara*), Agara (*Aquillaria agallocha*), Kapura (*Cinnamomum camphora*), Guggulu (*Commiphora mukul*), Ashwagandha (*Withania somnifera*), Neem (*Azadirachta indica*) etc are used as *yagya samagri*, while woods of Mango (*Mangifera indica*), Sandalwood (*Santalum album*), Deodar (*Cedrys libani*), Bilva (*Aegle marmelos*), Pipal (*Ficus religiosa*) etc are recommended.^{xx} The fumes lead to purification of air by oxidizing the carbonic compounds and along with that they have antimicrobial properties which benefit the people around.^{xxi} For purification of toxic air, *lakshaharidraadi yoga* is mentioned in which drugs like *laksha*, *haridra*, *ativisha* etc should be burned and its smoke should be spread all over to purify the toxified air and smoke.^{xxii} The rhythmical chanting of *mantra* and due to the divine power of words, the *mantra shakti* gets increase exponentially and expands the *mantra* vibrations to all dimensions which have preventive and therapeutic effects against various diseases.

❖ *Yuktivyapashraya cikitsa* (therapy based on drugs & logical reasoning)

It is done by the planned use of drugs, foods and regimen for the treatment of diseases caused by the vitiation of the *doshas* (bodily humors). It is further classified into three types: *Anatahparimarjana* (internal purification), *Bahirparimarjana* (external purification) and *Shastrapranidhana* (surgical therapy).^{xxiii} *Anatahparimarjana* (Internal purification) includes *sodhana* (purificatory measures) and *shamana* (palliative measures). Purificatory measures such as *vamana* and *nasya* helps to eliminate the vitiated *doshas* located in the chest and head respectively as these are the areas concerned with the *pranavaha srotas* (respiratory system). If the condition of the patient is mild then it can be managed through palliative measures. *Bahirparimarjana* (external purification) is done by application of massage, sudation etc.^{xxiv} If someone get affected with such type of polluted environment then *shobhanjanmooladi agad* should be used for treatment.^{xxv}

❖ *Satvavajaya cikitsa* (psychotherapy)

Psychotherapeutic measures like mind control methods, reconciliatory measures and moral behavioral code should be carried out.^{xxvi} Mind control and reconciliatory measures should be carried out over the patients who are habituated to smoking. With the help of moral behavioral code, we can advise patient to wear mask, to do purification of air through *yagya*, to travel through public transport, to apply ghee in the nostrils before travelling out, to do regular exercises and yoga practices etc.

DISCUSSION

Apart from the above mentioned treatment modalities, we can advise the patient for *nidana parivarjana* i.e. avoid the causative factors. For example if the disease is caused due to the surrounding outdoor pollution then shift to the new area, if the disease is caused due to occupation then one should change the occupation etc. however the above mentioned care is not every time possible so the best way is to prevent the impact of pollution on our body. This can be achieved through building immunity. Thus *rasayanas* (rejuvenation) mentioned in *ayurveda* helps to build our immunity so that our body gets less prone to disease. Certain *rasayanas* (rejuvenation) like *chyavanprash* is having therapeutic properties against *kasa* (cough), *swasa* (dyspnoea) too along with *rasayana* (rejuvenation) properties.^{xxvii} Following *dincharya* (daily regimen) mentioned in *ayurveda* and consuming *rasayana* (rejuvenation) drugs helps us for the prevention of the air pollution borne diseases. *Yagya* should be performed at both social as well as personal level which helps to overcome outdoor as well as indoor air pollution respectively. Now days corona virus pandemic has taught us the importance of *yagya* as an important step to fight against such new microorganisms in the air.

CONCLUSION

Thus it is crystal clear that polluted air causes severe impact on atmosphere as well as the living beings especially humans. It affects the body as well as mind equally. *Ayurveda* has very basic thought to control and purify the polluted air with the help of various therapeutic measures quoted above. Along with that following the daily regimen, seasonal regimen as well as the code of good conduct, the air pollution borne diseases can be prevented with the *ayurvedic* life style. Hence it is a need of hour to create awareness of these ancient modalities from *ayurveda* for the prevention and to treat these diseases successfully. We, youth of today's generation should create awareness among the future generation and we should take necessary steps to prevent and overcome the harmful effects of air pollution. Further clinical researches in therapeutic modalities are necessary to revalidate *ayurveda* principles.

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