Conclusion

7.0. CONCLUSION

In the 21st century, a huge population throughout the world is affected by arsenic contamination either through long-term exposure of arsenic in drinking water, or industrial pollution leading to adverse health effects. This is also a burning problem of vast populations in Eastern India. The ingestion of arsenic is the cause of global health hazards by the drinking water. The affected peoples of India are unintentionally being slowly poisoned through the arsenic polluted drinking water. The affected peoples of rural low economic groups suffer from skin cancer, metabolic disorders, reproductive hazards, infertility, etc. through arsenic-contaminated drinking water.

It is a national as well as global challenge to prevent arsenic-induced reproductive toxicity. Some chelating agents are available in the market such as British Anti Lewsite (BAL), dimercaptosuccinic acid (DMSA), unithiol or 2,3- dimercaptopropane sulfonic acid (DMPS) to prevent arsenic-induced health hazards but these have noninvasive, painful treatment strategy. Therefore an attempt was given here to develop an easily available cost-effective drug against arsenic mediated disorders with no toxic effects. To search this comment, we have planned to study the effects of the said cost-effective bio-molecules on arsenic-induced female reproductive disorders since arsenic is one of the main causative factors of infertility in women in the affected zones. So, the output of this research work will help to precede the work on higher mammals for the development of potent drug or neutraceuticals against arsenic mediated toxicity.

The present study was proposed to show the role of arjunolic acid and or vitamin B_{12} against arsenic-induced oxidative stress and female reproductive dysfunction. Adult Wistar strain female rats were selected for the treatment strategy with arjunolic acid at the dose of 1.0 mg /100gm bodyweight and vitamin B_{12} at the dose of 0.09µg/100gm body weight alone or in combination manner against arsenic at the dose of 1.0 mg /100gm body weight. In ovarian and uterine tissue

arsenic induced ROS-production is corrected by the treatment with arjunolic acid and or vitamin B_{12} via stimulating the endogenous enzymatic antioxidants activity along with its expressional status in terms of protein. Arjunolic acid and vitamin B_{12} have the ability to alleviate the apoptosis, necrosis, and ovarian-uterine tissue damages in arsenic ingested rats through improving the levels of ovarian steroidogenic enzymes (Δ^5, 3β-HSD and 17β-HSD), hormones (LH, FSH, and estradiol) and inflammatory markers (NF κB, TNF-α, and IL-6). Treatment with these B_{12} and arjunolic acid against arsenic could also restore the ovarian level of estradiol receptor α_1 (ESR- α_1) The levels of NPSH and lipid peroxide end products such as MDA, CD was reversed by the treatment with these bioactive substances. However, *in vivo* arsenic-induced oxidative stress and female reproductive dysfunctions may be alleviated by the treatment with arjunolic acid and or vitamin B_{12} where an indirect mechanism involving hypothalamico-pituitary-ovarian axis may play a critical role whereas in vitro assay system of experimentation cannot deny the possible direct action of arsenic as well as arjunolic acid and or vitamin B_{12}.

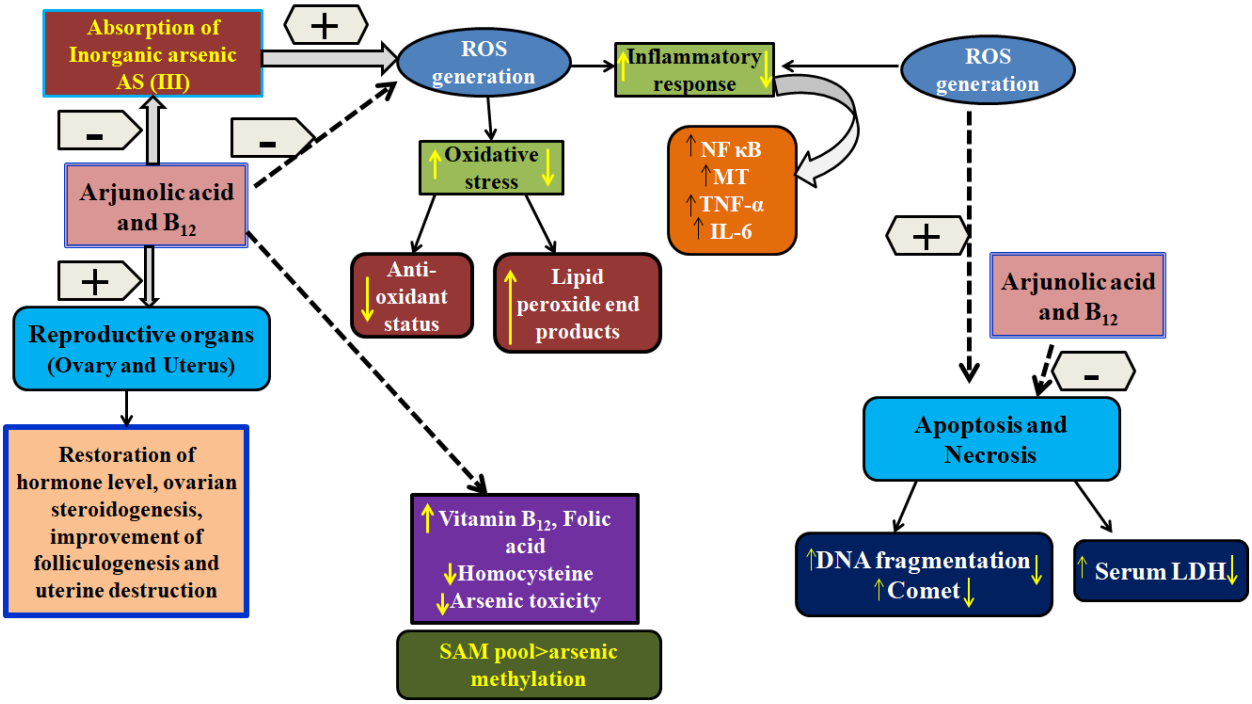

Fig. Schematic diagram of the mechanical action of arjunolic acid and vitamin B_{12}.