Introduction
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Organic solvents are a distinct group of substances characterized by their ability to dissolve oils, fats, plastics, rubber and resins. They are divided into different categories according to their chemical composition. Solvents were derived from the distillation of coal tar during the later part of the 19th century. The chemical industry found numerous applications for these previously unknown solvents as the science of organic chemistry emerged. Soon other raw materials, such as petroleum, replaced coal tar in the production of these solvents. Chlorine came into the market during the early 1920's as a byproduct of the alkali industry, and was soon used to chlorinate aliphatic hydrocarbons leading to the introduction of chlorinated solvents into the market place. The use and often abuse of these chlorinated solvents was soon followed by reports of toxic effects on exposed workers. The chlorinated solvents are colorless liquids, heavier than water and effectively nonflammable in use.

Trichloroethylene is a chlorinated aliphatic solvent. As stated above it is a colorless liquid at room temperature with a somewhat sweet odor and a sweet burning taste, mainly used for the degreasing of manufactured metal parts (80-95% of consumption). Other applications of TCE include industrial dry cleaning, printing, and production of printing ink, extraction process, paint production and textile printing. Consumer products that contain TCE include typewriter correction fluids, paint removers, adhesives and stain removers. TCE has attracted great attention among the general public because of its leakage from industrial setting into the general environment, particularly in to ground water. Due to its wide use of large quantities, it has become a common environmental contaminant. It has been found in ground water, surface water, ambient air and soil. Because TCE is pervasive in the environment, most people are likely to be exposed to TCE by simply eating, drinking and breathing. TCE has been found in a variety of foods, with the highest levels in the meat. TCE was earlier used as a solvent for extraction of natural fats and oils, spices and coffee, but the US Food and Drug Administration (FDA) banned these uses. TCE is readily absorbed through gastrointestinal tract, lungs and skin. Following absorption, trichloroethylene is distributed all over body tissues, and also crosses the blood brain barrier and the placenta. The principle site of biotransformation is liver and lung. The major metabolic route is oxidation by cytochrome P-450 mixed
function oxidases giving trichloroethanol, trichloroethanol–glucuronide and trichloroacetic acid as main metabolites. Metabolites are excreted primarily in the urine. These metabolites are associated with liver and lung toxicity. Another byproduct, dichlorovinyl cysteine (DCVC) is a metabolite of the glutathione pathway and is associated with kidney toxicity. In humans and animals, part of the absorbed amount of TCE is exhaled unchanged (11-40%). TCE is a fairly toxic chemical, causes liver, kidney, lung, nervous system and immune system toxicity. The major route of TCE elimination is by exhalation through the lungs.

The surface area of lung is expansive- approximately the size of a tennis court. The extremely thin delicate gas exchanging epithelium of the large organ allows efficient diffusion of oxygen and carbon dioxide between inspired air and the pulmonary circulation. An average person inhales about 10,000 litres of gas per day; this gas is laden with bacteria, viruses, oxidants, pollutants and allergens. Fortunately, several immune mechanisms function in the lung to help maintain its sterility; one of them is pulmonary surfactant. Pulmonary surfactant, which covers the peripheral airway, is a mixture of lipids and proteins. There are four surfactant proteins (SP) namely SP-A, SP-B, SP-C and SP-D. Surfactant protein SP-A and SP-D are hydrophilic and SP-B and SP-C are hydrophobic. The hydrophilic surfactant proteins (SP-A and SP-D) play an important role in host defense mechanism of the lung. These proteins belong to collectin subgroup in which lectin domains are associated with collagenous structures. Collectins are considered to function in pulmonary innate immune systems. SP-A and SP-D interact with various microorganisms and pathogens derived components. They act as opsonins by binding and agglutinating pathogens. The lung collectins also exerts inhibitory effects on bacterial growth. SP-A and SP-D associate with immune cells, and activate various cellular functions. The direct interactions of SP-A and SP-D regulate inflammatory cellular response such as release of pro-inflammatory cytokines. SP-A and SP-D knockout animal models reveal significant defect in host defense, susceptibility to bacterial and viral infections, delayed microbial clearance and over expression of pro-inflammatory cytokines. Since the lungs are continuously exposed to ambient air that contains significant number of microorganisms, the role of SP-A and SP-D in the innate
Immune system of the lung are physiologically important. It is envisaged in present studies to explore the toxic potential of trichloroethylene on pulmonary surfactant proteins and map out the expression of immunomodulatory surfactant proteins (SP-A & SP-D). Therefore, the present study was aimed with the following objectives.

- To characterize the biochemical alterations after TCE exposure with special reference to pulmonary system.

- To elucidate the effect of TCE exposure on bactericidal property of lung surfactant.

- To elucidate the effect of TCE exposure on pulmonary bacterial clearance.

- To map out the expression pattern of immunomodulatory surfactant proteins (SP-A & SP-D) after trichloroethylene exposure.