Essential Trace Elements in Relation to Anesthesia and Intensive Care

Essay Submitted for Partial Fulfillment of the Master Degree in Anesthesia

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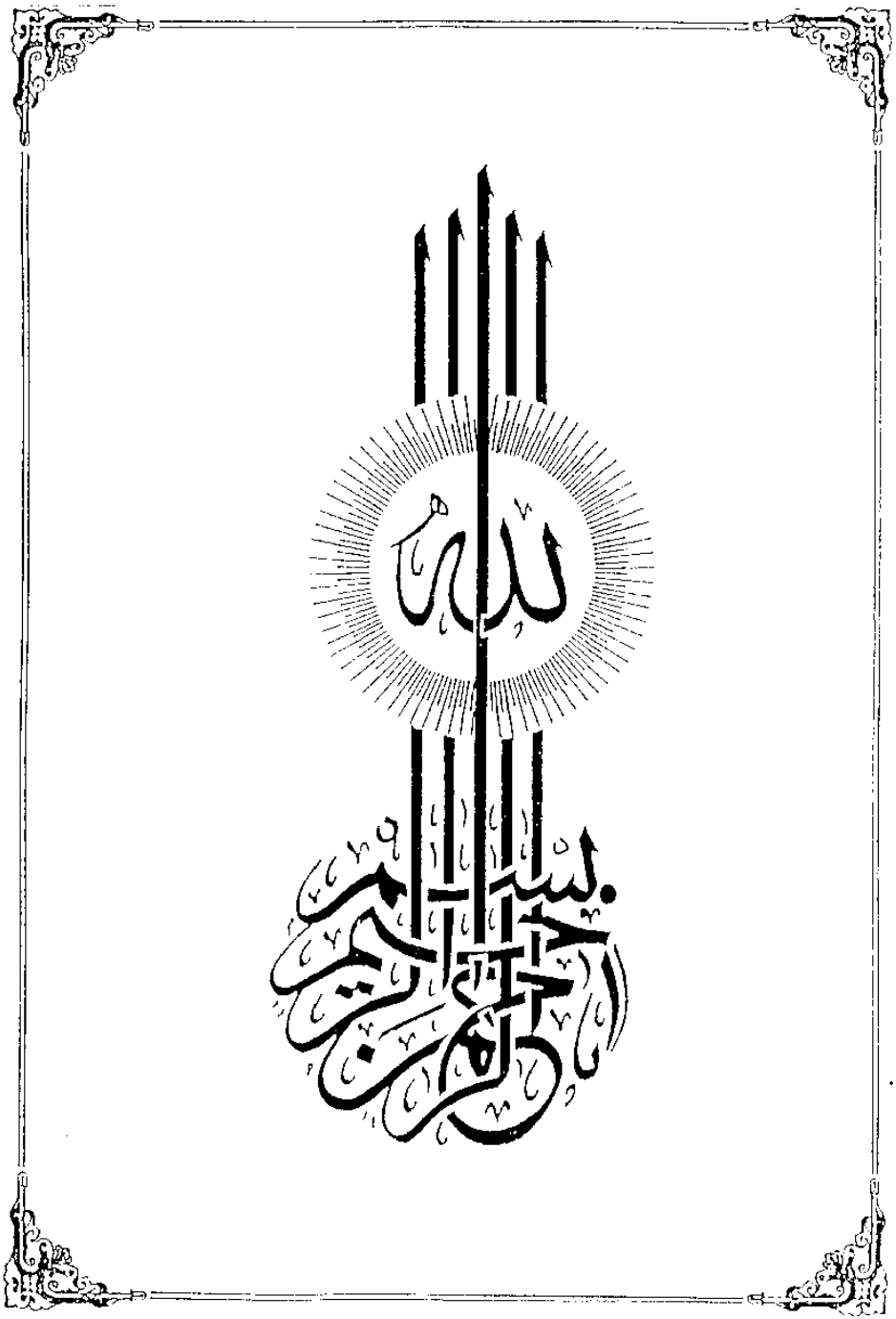

بسم الله الرحمن الرحيم

قالوا سبحانك لا علم لنا إلا ما علمتنا إنك أنت العليم الحكيم

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Trace elements are inorganic ions present in tissues in a minute quantity, micrograms to picograms per gram of wet organ. The essential trace elements are : iron, copper, selenium, iodine, cobalt, manganese, molybdenum, chromium, fluorine, zinc, and nickel ***(Shaw, 1980)***.

Less than a decade ago, only seven trace elements were considered essential for man. Today they are about fifteen. Studies have shown that trace elements are important for many enzymes that regulate key metabolic pathways in the human body. Virtually all organs are influenced by trace element deficiencies. Such disturbances in nutrient balance may be primary or secondary to other disease. In both situations, deficiencies can be corrected by appropriate amounts of oral or parenteral supplements. It has also become clear that excessive intake of essential trace elements can result in adverse effects ***(Hambidge, 1986)***.

Trace element deficiencies present clinically with non-specific features. Perhaps the most frequent feature is weight loss, or in the case of infants and children, is failure to achieve maximal growth ***(Hambidge, 1986)***. Trace element deficiencies are seldom diagnosed on the basis of clinical features alone. However, they may be suspected in the presence of the right etiological circumstances. Several trace element deficiencies - like zinc, copper, chromium, molybdenum, and perhaps selenium - have been documented in patients maintained on

prolonged intravenous nutrition without adequate trace element supplementation ***(Besunder and Smith, 1991)***.

Epidemiological evidence suggests that the development of life-threatening diseases, such as cancer and heart diseases, are linked to our dietary intake of trace elements including antioxidants ***(Gutteridge, 1994)***.