

## LEAD TOXICITY AND HUMAN REPRODUCTION : A REVIEW

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Both organic and inorganic forms of lead can affect different organ systems of the body. But it is mainly the inorganic form which affects the reproductive system<sup>1</sup>.

This fact was known by the Romans who prepared a sour honey preparation called "oxymel" by heating honey with sea water in a lead container. (This acidic preparation would have absorbed large quantity of lead from the container). It was used as a contraceptive and abortifacient<sup>2</sup>. Gilfillan, in a classic study pointed out many ways in which lead toxicity could have occurred in Romans. It is mainly the effect of lead on reproductive and nervous system which is hypothesized to be one of the causes of the fall of Rome<sup>2</sup>. During world war I lead based abortifacient drugs became so widespread that there were out-breaks of lead poisoning among British women of child bearing age<sup>3</sup> and even quite recently compounds containing lead were locally applied to induce illegal abortions<sup>4</sup>.

Lead can effect both male and female reproductive systems. \*In males exposed to lead there could be a decrease in sexual drive, impotence, decreased ability to produce healthy sperms and sterility<sup>1</sup>. Teratospermia, hypospermia and asthenospermia can also occur<sup>5</sup>.

Asthenospermia and hypospermia have been noticed at mean blood lead levels of 41 ug/100 gm.; teratospermia at 53 ug/100 gm and there appears to be a dose response relationship<sup>1</sup>.

Initially these effects could be the result of direct testicular toxicity of lead but as the duration of exposure increases the hypothalamic-pituitary-testicular axis could also be disturbed<sup>6</sup>. A study has reported a selective effect of lead on LH regulation at the hypothalamic or pituitary level<sup>7</sup> but another study suggests only a direct testicular toxicity<sup>8</sup>. In addition lead can decrease the function of the prostate and/or seminal vesicles<sup>9</sup> leading to a defect in transportation of sperms<sup>6</sup>. Chromosomal alterations produced by lead<sup>12</sup>, have also been suggested to play a role in reproductive dysfunction. After the use of standard chelation therapy cases of reversible<sup>9</sup> and not readily reversible reproduction dysfunctions have been reported<sup>11</sup>.

Women exposed to lead experience menstrual disturbances, including, dysmenorrhea, menorrhagia and amenorrhea. Following exposure to lead women have high incidence of sterility premature births, spontaneous miscarriages and still-births<sup>1</sup>. Genetic damage by lead in egg and sperm can result in failure to implant, miscarriage and still-births<sup>1,12</sup>. Increase in twinning rate has also been reported with low dose exposure to lead<sup>10</sup>.

Although a number of studies show that lead can interfere with the reproductive system yet the exact mechanisms producing these variety of effects are not known.

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