

Bio America 2016 : Molecular profiling of testis in arsenic induced mice - Akhileshwari Nath - S S Hospital and Research Institute

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Arsenic is a potent environmental toxicant and affects biological system through food chain causing toxicity and disturbs different signaling pathways, thus suppresses immune system and finally causing various diseases. In previous study, extensive survey work has been made in arsenic hit area and drinking water and blood samples were collected. Tissue samples have been collected from cancer patients at S S Hospital and Research Institute. After the confirmation of significant high level of arsenic in drinking water, blood and tissue samples, present study was undertaken. Present study was undertaken to observe the effect of arsenic in testicular cells in mice model and its effect on testicular gene expression. Sodium arsenite was administered into Swiss albino mice as 2 mg/kg body wt. for the different durations. Estimation of arsenic was done by atomic absorption spectrophotometer. TUNEL assay was done to observe the DNA damage and microarray analysis was performed to observe the mRNA expression profile in sodium arsenite administered mice model. High accumulation of arsenic was found in testes of Swiss albino mice. Significant DNA damage was observed in arsenic administered testicular cells of Swiss albino mice. Further, mRNA of few genes shows their altered expression. In the present study, it can be concluded that arsenic affects testicular cells leading to DNA damage and alter testicular gene expression. Thus, our results suggest that mice with high accumulation of arsenic shows altered gene expression. effect of arsenic turned into studied on the testicular tissue of Swiss albino mice. Sodium-meta- arsenite (NaAsO_2) became administered to person mice ($25\pm 30\text{g}$) at a dose stage of 30 mg/L and forty mg/L through consuming water for 30, forty five and 60 days. After the treatment, the testicular organ turned into removed, weighed and processed for histopathological commentary. The result showed that arsenictreated mice exhibited dose based slow reductions in seminiferous tubular diameter and diverse gametogenic cellular population i.e. resting spermatocyte, pachytene spermatocyte and step-7-spermatid except spermatogonia. Leydig cellular atrophy was extensively extended in dose structured way indicating a precise effect of arsenic on the spermatogenesis in mice. These observations were supported by way of slow reduction in Leydig mobile population inside the above treated agencies. In end, the above effects verify the poisonous effect of arsenic in testis of mice. Arsenicals are enormous inside the environment due to natural and anthropogenic incidence. Ingestion of contaminated ingesting water is the fundamental routes for

human publicity to arsenic. Arsenic exposure reasons both acute and chronic toxicity in human. Human arsenic exposure is related to severe fitness problems which include skin cancer, diabetes, liver, kidney and CNS problems. It also causes many different poisonous outcomes. Male reproductive effect of arsenic become first studied in mice, then in fishes. Arsenic exposure in experimental rats has proven to produce steroidogenic disorder leading to impairment of spermatogenesis. Few current investigations have proven that arsenic in consuming water is related to oxidative pressure, genotoxicity in testicular tissue of mice. On the other hand recent have a look at suggests that arsenic causes testicular toxicity probable by using affecting the pituitary testicular axis. however the dose and length dependent impact of sodium arsenite in consuming water on testicular tissue of mice is not nicely hooked up. for that reason the purpose of the prevailing look at turned into to study the results of 30 or 40 mg/L sodium arsenite in consuming water for 30, forty five and 60 days on the histology and spermatogenesis of the testes of mice. Arsenic is considered as poisonous steel, which displays on human health. various people have determined systemic disorders, but male reproductive have a look at with regards to arsenic toxicity is spare. in advance study indicated that heavy metals like lead, mercury and chromium reasons cytotoxic effect within the male reproductive feature. Arsenic exposure to Swiss mice, in the gift observes, step by step reduced the testicular weight compared to manipulate suggesting cellular regression of the testicular tissue. This commentary is in corroboration with the earlier locating of Pant et al 2004. Testicular histology on this study exhibited excessive cellular damage in spermatogenic mobile. Moreover, the arrival of eosinophilic multinucleated large cell within the seminiferous tubule in higher handled organization indicated cellular degeneration. A full-size slow dose based regression became located in the variety of resting spermatocyte, pachytene and spherical spermatid in 30 and 40 mg/L over a duration of 60 days, while there was no massive decrease within the variety of spermatogonia. those locating acts as a trademark that the maturation of spermatogonia through the technique of meiosis has been significantly disrupted following arsenic exposure. The above observation is in agreement with the current locating of Omura et al. 2000. Degeneration of interstitial (Leydig) cells turned into found in the testis of arsenic-treated mice. Furthermore Leydig cellular population extensively decreases in each the doses over duration of 60 days. The Leydig mobile

nuclear diameter extended significantly in both the doses in 30 days observed by using slow diminution of the Leydig mobile diameter in 45 and 60 days. in spite of a testosterone assay in this have a look at, it may be counseled that the degeneration of Leydig cellular with tremendous lower inside the Leydig mobile populace probably could have resulted in reduced synthesis of testosterone, which in turn disturb the manner of spermatogenesis. The exogenous arsenic publicity might also cause a chemical pressure on the mobile function. The initial growth in Leydig cellular diameter may be a better indication to adopt the metal prompted strain but due to non-stop strain effect, cell exhaust can be a result of Leydig mobile atrophy.

Biography:

Akhileshwari Nath has completed her PhD in 1974 from Patna University, India and did Postdoctoral training on Electron Microscopy at Minneapolis, Minnesota, USA in 1976. She is retired Professor and Head of the Department of Zoology from Patna University, India. She was the Head of Mahavir Cancer Institute & Research Centre, India till January 2015. Presently she is the Head of S S Hospital and Research Institute, India. She has published more than 130 papers in reputed journals and completed 5 major research projects funded by Government of India.

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