Drowning in Home Environment: A Little Recognized Mode of Fatal Injury in Indian Infants and Toddlers

Bucket-associated drowning in unattended infants and toddlers is not an uncommon occurrence; although, it remains largely unrecognized and under-reported [1-3]. There is a scarcity of published reports in medical journals on these largely preventable deaths in India [4,5].

We performed a descriptive analysis by internet search of news reports in well- known Indian newspapers to gather information on such deaths by using different combinations of keywords. National crime record bureau (NCRB) of Indian Police, and Ministry of Health and Family Welfare, Government of India Websites were also assessed for available data [6].

From April, 2016 to March, 2022, there were 18 drowning reports at home that resulted in fatalities across India. On Pubmed search, we found a population based study, where two babies both aged 1.5 years under care of mothers drowned in water storage vessels and a 1-year-old boy who nearly drowned in concentrated sugar syrup (*chashni*) made at marriage home [4,5]. Thus, data on a total of 20 drowning deaths at home were extracted. We excluded drowning deaths occurring anywhere except buckets/water storage vessels occurring in home environments.

Majority (65%) of victims were boys aged 12-18 months, and most (85%) were playing unattended. Two babies were fetching water from a storage vessel to drink and, remaining one case involved bathing by a toddler sibling not supervised by elders. Studies from other countries have also reported bucketassociated drowning death [1,2] being a common problem, wherever buckets are used for water storage at home. Due to the inherent limitations, it is assumed that our data is gross underestimation of actual data as drowning may happen in cases who did not got media coverage, rural/peripheries news not getting coverage in electronic media and news not getting media space. Duplication of data was avoided based on victims and geographical/temporal details. This analysis identifies one of the little recognized sources of drowning in infants and toddlers in home environment associated with buckets, which are used for water storage in almost every Indian household. Even if partially filled, it may pose significant drowning hazard to unattended children. This report raised an important issue of this health threat due to its ubiquitous use, and also reminds pediatricians for counselling for injury prevention at home.

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Bolus Dose of Vitamin D to Lactating Mother and Calcium Transfer in Human Breastmilk

We read with interest the article by Ramot, et al. [1]. We compliment the authors for this study on bolus vitamin D supplementation to lactating mothers in improving maternal and infant vitamin D status. We would like to highlight certain aspects in the study, and request clarifications from the authors.

The use of bolus dose of vitamin D compared to daily dose may not be physiological. The Infant receives vitamin D in its parent form (vitamin D3) from breastmilk. Vitamin D3 is rapidly converted to 25(OH)vitamin-D, which cannot be secreted in the breast milk; therefore, daily dose of vitamin D to the mother is required to achieve sufficient transfer in breastmilk [2]. References cited by authors to substantiate bolus dose showed the levels of vitamin D in maternal blood and breastmilk dropped significantly after day 1 of bolus dose; however, these were uniform when mothers were supplemented daily [3,4]. One of these studies was done in non-lactating mothers, where the physiology of vitamin D is significantly different [3]. The authors did not mention the time frame of collection of blood sample for vitamin D estimation after bolus dose. Non-availability of vitamin D levels in breastmilk further dilutes the conclusions of study.

The serum vitamin D levels were estimated using automated chemiluminescent immunoassay, which cannot differentiate between the two forms of vitamin D, 25(OH)vitamin-D2 and 25(OH)vitamin-D3, and has a cross reactivity with other vitamin D metabolites [5].

Lactating mothers increase calcium content of breastmilk by increasing the dietary intake, gut absorption, and bone resorption by parathyroid-related protein (PTHrP) [2]. Relation between maternal vitamin D and serum calcium is linear during vitamin D deficiency. In Table II and III of the study, maternal and infant serum calcium levels are significantly low at 1 year post-bolus of vitamin D supplementation compared to baseline, which normally should have been more. This finding needs some deliberation. The study does not reveal the details of calcium supplementation to lactating mothers and infants. Vitamin D replenishment without calcium supplementation may be counter-productive due to progressive bone-resorption by activated PTHrP [2].

The study likely deprived the infants of recommended vitamin D supplementations as per IAP recommendations [5]. The details of exclusive and total breast feed duration, and complementary feeding are also missing.

The primary concern with bolus doses of vitamin D is toxicity. Though the authors have defined the exclusion for toxicity; criteria of stopping the trial in case excessive vitamin D toxicity is encountered is unclear. Monitoring for toxicity twice only at 6 months and at 1 year seems too less for an intervention, which has been postulated to have no additional skeletal benefit apart from raising vitamin D levels [5].

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AUTHOR'S REPLY

We thank the editor of the esteemed journal Indian Pediatrics and fellow readers for showing interest in our study and appreciate their concerns.

We have already mentioned that daily dosing of vitamin D supplement is more physiological than bolus dose; however, efficacy may be affected by poor compliance and acceptability. The maternal serum vitamin D estimation was done at baseline i.e., before starting of vitamin D supplementation and after 12 months of supplementation. We agree, that study results would have been more robust with estimation of breast milk vitamin D levels. Estimation of breast milk vitamin D is a tedious job and our lab has not standardized the breast milk vitamin D assay so it was not planned in the present study.

Chemiluminescent immunoassay certainly does not

differentiate between 25(OH) vitD2 and 25(OH) vitD3 forms. Vitamin D2 supplementation was not given at any time point during the study. Therefore, differentiating between vitamin D2 and D3 does not seems to be essential.

The concern of lower serum calcium after vitamin D supplementation in both, mother as well as infants as compared to baseline level is valid. However, all values were within normal range. Measurement of serum iPTH could have answered this differential response, since long standing deficiency of vitamin D might have led to secondary hyperparathyroidism thereby maintaining serum calcium levels and with supplementation of vitamin D one year, serum iPTH must have reached normal limits. Also, measurement of ionized calcium could have helped to answer this differential response. Due to logistic issues with collection, storage and transportation of samples, serum iPTH levels were not planned to be measured in the present study.

No additional calcium supplementation was provided to mothers and infants other than 1g calcium supplementation, which is prescribed to lactating mothers as a part of routine clinical care. This supplementation was uniform for both the groups so differential effect of calcium supplementation would have been neutralized between the groups.

The concern about not using recommended vitamin D supplementation is well accepted; however, its practical applicability is reported to be affected by poor compliance (<20%; reference 9 in manuscript). There is published evidence for high dose vitamin D supplementation to lactating mothers to address the dual problem of vitamin D deficiency in mother-infants duo. This aspect has already been discussed in the manuscript. Moreover, since both groups received vitamin D and not the placebo, there was no concern of vitamin D deprivation in either groups.

The issue of monitoring for toxicity seems theoretical. We have used validated and standard criteria for monitoring, which have been used by others and us previously also [1].

There is sufficient literature on safety of high doses of maternal vitamin D supplementation. Endocrine society recommends 4000-6400 IU/day to lactating mothers to maintain serum 25OHD levels >30 ng/mL in exclusively breast fed infants [2]. Therefore very low risk of toxicity is anticipated with such doses of vitamin D supplementation.

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