Correlation Between Platelet Parameters and Urinary Phenol Level: A Note in Subjects Exposed to Benzene

Dear Sir,

Benzene is a common toxic volatile hydrocarbon. It is used as a necessary reagent in many modern industrial industries.\(^1\) Agency for Toxic Substances and Disease Registry (ATSDR) registers for benzene toxicity and recommends for the monitoring of benzene exposure for risk groups.\(^2\) Considering the chronic toxicity potential, there are clinical evidences indicating that benzene is a primary inducer of many blood diseases especially for anemia and leukemia.\(^3\) However, the effect of benzene on platelet is not well documented. This study is to correlate between the urinary phenol level, the standard biomarker for accumulated uptake of benzene, and platelet in the subjects, occupationally exposing to benzene.

Twenty-four male volunteers, who had no previous history of underlying hematological disorder and occupationally exposed to benzene were recruited. All subjects were traffic police-men and had already worked at the same police station (Lumphini Police Station, Bangkok, Thailand) for 5 years. Each subject provided a urine sample for phenol level determination using standard colorimetric method and an EDTA blood sample for analysis for platelet count and platelet index analysis using the automated hematology flow cytometry analyzer, Technicon-H*3. Data from all was systematically collected for further statistical analysis using SPSS 7.0 for windows program.

The averages (mean \(\pm\) SD) of urinary phenol level and platelet count were 19.98\(\pm\)8.58 mg/gCr and 259.42 \(\pm\)46.94 \(\times\)10\(^3\)/µL respectively. The regression analyses showed no significant between urinary phenol level and any platelet parameters (platelet count, mean platelet volume: MPV, platelet distribution width: PDW and plateletcrit: PCT) (Table I). Although there was no statistical significance, the authors observed the trend of decreased platelet count, PDW and PCT, while the urinary phenol increased (Table I).

This result agrees with that of a previous observation of thrombocytopenia in the subjects exposed to benzene.\(^4\) In addition, using the upper normal limit of urinary phenol level (Special Lab, Bangkok Thailand) (20 mg/gCr) as the cutoff level, the non-statistically significant lower platelet count and PCT was observed in the subjects with urinary phenol higher than upper normal limit (n=6).

Of interest, our study is the first report pointing out the possible correlation between urinary phenol and platelet parameters. Based on these hematological data, further studies on the usage of urinary phenol level and platelet parameters as co-indicator in monitoring of benzene exposure in at risk subjects is recommended. Further studies with larger sample size focusing in details of hemostasis are also recommended. Some limitations of this study should be addressed. This work was a cross-sectional study to assess the correlation between platelet parameters and urine phenol level. However, the authors tried to select the subjects from the same occupation who worked in the same workplace and duration of exposure. It is impossible to study the level of urinary phenol level and platelet parameters before exposure starting the work as traffic police. Indeed, the change in the hematological system due to benzene is a chronic process\(^3\) and the pre-postexposure monitoring cannot demonstrate the change in hematological parameters.

**Table I**: Correlation between platelet parameters and urinary phenol level.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Correlation coefficient (r)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Platelet count (x 10(^3))/µL</td>
<td>-0.23</td>
<td>0.27</td>
</tr>
<tr>
<td>Mean platelet volume</td>
<td>0.29</td>
<td>0.17</td>
</tr>
<tr>
<td>MPV (fL)</td>
<td>-0.36</td>
<td>0.09</td>
</tr>
<tr>
<td>Platelet distribution width: PDW</td>
<td>-0.14</td>
<td>0.51</td>
</tr>
<tr>
<td>plateletcrit: PCT (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urinary phenol level (mg/gCr)*</td>
<td>1</td>
<td>0.00</td>
</tr>
</tbody>
</table>

* The averages (mean \(\pm\) SD) of urinary phenol level among all 24 volunteers are 19.98\(\pm\)8.58 mg/gCr.

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**REFERENCES**

Dear Sir,

Over the recent years, geriatric health issues have gained immense importance. It is commonly believed that the majority of the elderly population resides in developed countries. However, this is a myth, as about 60% of the 580 million elderly in the world live in developing countries, and by 2020, this number will increase to 70%.1 We are writing this letter to highlight the disturbing state of geriatric health in Pakistan, a developing South-Asian country.

Pakistan is a country with poor health indicators. Currently, it is the sixth most populous country in the world with an estimated population of 166 million.2 There are nearly 7 million elderly (65+ years) residing in Pakistan2 and only a few studies have been conducted to assess the health needs of this large segment of population. Emerging from these studies is a strong consensus: the elderly in Pakistan face a large number of psychological, social and physical health problems and the majority is dissatisfied with the available health care services (unpublished work by authors, currently under review for publication).3,4

The elderly in Pakistan are currently in a very delicate situation. The joint family system that traditionally provides care to them in old age seems to be rapidly eroding.5 Retirement benefits are rarely provided to employees of private corporations. The government provides a paltry pension, which hardly covers basic amenities; quality health care is a dream.

The dearth of geriatric health care in the country is evident by the fact that there are no specialized health care facilities available for the elderly. Furthermore, there are no geriatric specialists present in the country and it is likely there will be none in the future, because there are currently no training programs in geriatrics available for specialization.

Contrary to the popular belief that the elderly are a burden on society, the elderly can make significant contributions to the welfare of society as seen in many developed countries.1 We, too, need to invest in our elderly population and implement the concept of ‘Active Ageing’. The primary focus in achieving this goal should be improved healthcare for the elderly and it is imperative that decisive actions be taken immediately. If this is not done, the situation will regress from bad to worse, because the proportion of elderly in our population is predicted to increase.

The problem is evident but there are no plans to contain it. The relevant authorities seem impassive to the required health needs of the most vulnerable group in our society.

REFERENCES


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