Comorbidities increase In-Hospital Mortality in Dengue Patients in Brazil

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BACKGROUND

- Dengue represents an unmet medical and public health issue with more than half of the world’s population at risk
- Dengue patients with comorbidities may be at higher risk of death; however, there are few large-scale studies
- Data mining of hospital databases provides insights on the impact of diseases on the healthcare infrastructure and contributes to document the disease burden on public health
- Predictive factors for dengue mortality in high-risk populations could aid in determining those that would benefit most from dengue preventative measures

MATERIALS & METHODS

Retrospective analysis of risk factors for dengue mortality in a hospitalized patient database

- Co-morbidities increase In-Hospital Mortality in Dengue Patients
- Classical descriptive epidemiology
- Multivariate statistics
- Cox survival for Duration and Logistic regressions for Death and ICU admission after controlling by potential confounders (as age, year of inclusion)

RESULTS

Prevalence of Risk factors

<table>
<thead>
<tr>
<th>Comorbidity</th>
<th>Percentage Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yo)</td>
<td>Comorbidity Prevalence</td>
</tr>
<tr>
<td>0-8</td>
<td>Diabetes</td>
</tr>
<tr>
<td>9-45</td>
<td>Pulmonary disease</td>
</tr>
<tr>
<td>46-60</td>
<td>Renal disease/failure</td>
</tr>
<tr>
<td>61+</td>
<td>Diabetes</td>
</tr>
</tbody>
</table>

Mortality Rates

- The risk of death from hospitalized Dengue is higher in the presence of common comorbidities of any age

Severe hospitalized Dengue significantly higher in the presence of common comorbidities of any age

<table>
<thead>
<tr>
<th>Comorbidity</th>
<th>Risk Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes</td>
<td>3</td>
</tr>
<tr>
<td>Pulmonary</td>
<td>2</td>
</tr>
<tr>
<td>Renal</td>
<td>1</td>
</tr>
</tbody>
</table>

Modeling

- Risk of death from severe dengue was similar to HD and pulmonary diseases
- Duration of hospital stay, ICU admission and death were strongly correlated

- Age, dengue severity, comorbidities are independent and cumulative risk factors for longer hospital duration, ICU admission and death

<table>
<thead>
<tr>
<th>Comorbidity</th>
<th>Mortality Rates Modeling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes</td>
<td>Relative Mortality Ratio</td>
</tr>
<tr>
<td>Pulmonary</td>
<td>Renal disease/failure</td>
</tr>
</tbody>
</table>

CONCLUSIONS

- In a large retrospective in-hospital database of ½ million dengue cases in Brazil, severe hospitalized dengue occurred at any age; however, the majority of cases were in pre-adolescents and adults.
- Comorbidities, older age, severe age, dengue independent and cumulative risk factors for longer hospital duration, increased intensive care admission and in-hospital death.
- Ensuring access to dengue preventative measures in individuals 9 years and above including those with comorbidities could help these countries achieve the WHO objective of 15% reduction in mortality and 25% reduction in morbidity due to dengue by 2023

References

2. Half measures for dengue control. Malaria Newsletter and Disease Weekly Epidemic

Disclosures

This study was sponsored by Sanofi Pasteur including provision service of database consolidation, data mining and analysis by Ariana Pharmaceuticals.