Figure 1. Incidence of OHSUD varies by study criteria

- Figure 1 shows OHSUD incidence in Wake County calculated using time independent SUDDEEN criteria (Nanavati et al) compared with the incidence we would have obtained using published criteria for SUD.

- The calculated annual incidence of sudden death in Wake County, NC, is 4-19 times higher than published methods would report in our study population.

- Only 31% of our cases either died instantaneously or were last seen alive <24 hours before death. In 59% of cases time of death was unknown (Figure 2)

METHODS

- Potential cases of out of hospital sudden unexpected death were captured from 1138 Emergency Medical Service referrals in Wake County, North Carolina, United States of America, pop. 1.2 million, from March 2013 – March 2014. 310 potential cases were identified.

- Medical records were obtained for presumed sudden death subjects and cases were adjudicated for inclusion by three independent cardiologists and 187 cases were adjudicated into the study based on our time independent criteria.

- We stratified the study population by timing of death (less than 24 hours versus above 24 hours and unknown) and analyzed the observed difference in incidence between the two groups using unadjusted odds ratios.

RESULTS

- Table 1. Characteristics of SUDDEEN cohort by timing of death

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Witnessed or death within 24h</th>
<th>Unwitnessed, &gt;24h and Unknown Time</th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Cases</td>
<td>60</td>
<td>127</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean Age (SD)</td>
<td>50.1 (9.8)</td>
<td>54.5 (8.2)</td>
<td>1.06</td>
<td>1.02 – 1.09*</td>
</tr>
<tr>
<td>Mean BMI (SD)</td>
<td>32.4 (12.4)</td>
<td>29.3 (0.9)</td>
<td>0.97</td>
<td>0.94 – 1.01</td>
</tr>
<tr>
<td>Marriage Status at death</td>
<td>Married</td>
<td>18/38%</td>
<td>Unmarried</td>
<td>29/62%</td>
</tr>
<tr>
<td>Death Certificate Signatory</td>
<td>Physician</td>
<td>10/17%</td>
<td>Medical Examiner</td>
<td>50/83%</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>40/67%</td>
<td>Female</td>
<td>20/33%</td>
</tr>
<tr>
<td>Race</td>
<td>Caucasian</td>
<td>34/57%</td>
<td>Black</td>
<td>24/40%</td>
</tr>
<tr>
<td>Cause of Death</td>
<td>Cardiac Non-cardiac</td>
<td>32/53%</td>
<td>cardiac cause</td>
<td>17/28%</td>
</tr>
<tr>
<td></td>
<td>Unknown cause</td>
<td>7/12%</td>
<td>1/1%</td>
<td>0.86</td>
</tr>
</tbody>
</table>

*Cases meeting WHO criteria (Witnessed or death within 24 hours) were:
- Younger (50.1 ± 9.8 years 54.5 ± 8.2 years, p=0.001)
- Had a higher likelihood of a medical examiner issued death certificate (86.3% vs. 34.9%)
- Almost all the unknown causes of death in Wake County were included as SUDDEEN cases

DISCUSSION

- Time-limiting definitions underestimate the annual incidence of sudden unexpected death
- 69% of the SUDDEEN cohort would have been excluded if time-limiting definitions were used
- Adjudication of sudden death cases resulted in a much larger proportion of unknown primary causes of death when compared to death certificate-based case review
- An expanded study sample of a population-based cohort similar to SUDDEEN is needed to understand the differences in this often misclassified population

LIMITATIONS

- The SUDDEEN cohort consists of only out of hospital deaths: we have not yet analyzed survivors transported to the hospital
- Timing of death was obtained exclusively from Emergency Medical Services and Medical Examiner reports
- Medical records were not obtained for some subjects (33%), despite a systematic approach for record retrieval

REFERENCES


FUNDING

SUDDEEN is funded by the Department of Medicine, Office of Research, McAllister Heart Institute, National Center for Advancing Translational Sciences, (National Institutes of Health, Award Number 1UL1TR001111) at the University of North Carolina - Chapel Hill.

The authors have no relevant disclosures to report.