ABSTRACT

The present study was carried out during the period 2009 to 2012. A total 29 cases gunshot Suicides were studied. Males dominated the Victim group with the Male to Female ratio of 13.5:1. Majority of the Victims belonged to the age group 21-40yrs.In 93.1% of cases the Head was the most preferred region and Temple was the preferred Anatomical site .All the weapons used were Handguns and were Legally procured. Large majority of Victims[96.7%] preferred in House to commit the act. Marital/Relationship Crisis were the Major Motivating factors in 79.3% of cases. Psychiatric Illness contributed to only 6.9% of cases. 93.1% the victims were right handed. All the victims received single Shot. All the victims shot at contact range[31%] or loose contact range[69%].The wounds track were directed forwards and in 86.2% of cases the wounds were directed Right to Left ,upwards in 65.5% and Horizontal in 24.1%.Suicidal notes were found in 6.9% of cases. 27.6% of the victims Blood sample was positive for Alcohol. Victim clothes were intact in 86.2% of cases. 93.1% of cases the incidence took place between 8pm to 2am.In 89.7% of cases the Surroundings were intact. The Crime scene was compromised in 37.9% of cases. In all the cases the Weapon, spent shell were recovered from the crime scene. Ballistic examination of the weapon, spent shell and Bullet was done in all cases. Swabbing of both the hands for gunshot residue was done in all cases. A combined approach including Circumstances, Crime scene examination, Autopsy, Ballistic examination is important to arrive at the exact Manner of death in Gunshot Suicides.

Keywords: Gunshot, Suicide, Contact Range, Suicide Note, Ballistics.
INTRODUCTION:

Suicide is the act of intentionally causing one's own death. The most commonly used method of suicide varies by country and is partly related to availability. Common methods include Hanging, Pesticide, Poisoning, and firearms, though this methods varies from region to region [1]. Around 800,000 to a million people die by suicide every year, making it the 10th leading cause of death worldwide [2,3]. Rates are higher in men than in women, with males three to four times more likely to kill themselves than females [4]. There are an estimated 10 to 20 million non-fatal attempted suicides every year [5]. Attempts are more common in young people and females. Socio-economic problems such as unemployment, poverty, Homelessness, and discrimination may trigger suicidal thoughts [6,7]. About 15–40% of people leave a Suicidal notes [8].

It is observed that suicide rates have been found to be greater in households with firearms than those without them [9]. Hence it is this easy availability of the Firearm in the Region the Major cause of Suicides. Majority of the Suicides due to Firearm involved the Head. There are instances wherein speculations dominate in cases of Suicides due to Firearm. It is always necessary to rule out the Accidental and Homicidal Causes before concluding it as a Suicide. Hence meticulous examination of the Crime scene, Autopsy Examination, Toxicological Analysis, Ballistic examination and Victims Past Medical(Psych) condition is important. Hence the final Conclusion should be always based on the combination of this factors for the proper understanding the Manner of Suicide. This Autopsy study was carried out in Jamaica during the period 2009 to 2012.

AIMS:

1. To study the circumstances surrounding suicides due to Gunshot Wound.
2. To study the Age and Sex group involved in Suicides due to Gunshot Wound.
3. To Study the Characters of the Victim of Suicide due to Gunshot Wound.
4. To study the Type of Weapon used in Suicide due to Gunshot Wound.
5. To study the Entrance and Exit wound and its site, Direction of the Track in Suicides due to Gunshot wound.

MATERIALS

1. Firearm.
2. Ammunition

METHODS

2. Radiological Examination of the Body.
3. Entrance wound number, Position and pattern.
4. Exit wound, position, number and pattern.
5. Track taken by the Bullet, fragments, Ricocheting and Internal Damage.
6. Brain injury studied only after proper Fixing of the Brain.
7. Toxicological analysis of Blood, Urine, Vitreous along with the Visceral Samples.
10. Final Opinion is based on the Combined report of Crime scene Examination, Autopsy Examination, Toxicological Analysis, Technical Details[Phone/CCTV], Past Medical History and Ballistic Examination Report.

OBSERVATIONS:

<table>
<thead>
<tr>
<th>TABLE 1. Sex Group involvement.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MALES</td>
</tr>
<tr>
<td>FEMALES</td>
</tr>
<tr>
<td>TOTAL</td>
</tr>
<tr>
<td>M:F ratio</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TABLE 2. Age Group Affected.</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;10yrs</td>
</tr>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

| TABLE 3. Type of Weapon used. |
Shot Gun: Nil
Hand Gun: 29
Automatic weapons: Nil
Legal: 29
Illegal: Nil

Tabel no 4. The Characters of a Suicidee [Victim].

<table>
<thead>
<tr>
<th>Character</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right handed</td>
<td>27</td>
<td>93.1%</td>
</tr>
<tr>
<td>Left Handed</td>
<td>02</td>
<td>6.9%</td>
</tr>
<tr>
<td>Place of Residence</td>
<td>28</td>
<td>96.6%</td>
</tr>
<tr>
<td>Work place</td>
<td>01</td>
<td>3.4%</td>
</tr>
<tr>
<td>Others</td>
<td>00</td>
<td>0%</td>
</tr>
<tr>
<td>Nude</td>
<td>4</td>
<td>13.8%</td>
</tr>
<tr>
<td>Clothes present on body</td>
<td>25</td>
<td>86.2%</td>
</tr>
<tr>
<td>Alcohol/Drugs</td>
<td>8</td>
<td>27.6%</td>
</tr>
<tr>
<td>Psychiatric conditions</td>
<td>2</td>
<td>6.9%</td>
</tr>
<tr>
<td>Domestic crisis</td>
<td>2</td>
<td>6.9%</td>
</tr>
<tr>
<td>Marital/Relationship Crisis</td>
<td>23</td>
<td>79.3%</td>
</tr>
<tr>
<td>Financial crisis</td>
<td>4</td>
<td>13.8%</td>
</tr>
<tr>
<td>Medical conditions</td>
<td>00</td>
<td>0%</td>
</tr>
<tr>
<td>Suicidal note</td>
<td>2</td>
<td>6.9%</td>
</tr>
<tr>
<td>Time of Incidence 8pm-2am</td>
<td>27</td>
<td>93.1%</td>
</tr>
<tr>
<td>Time of Incidence 2am-1pm</td>
<td>00</td>
<td>0%</td>
</tr>
<tr>
<td>Time of Incidence 2pm-8pm</td>
<td>02</td>
<td>6.9%</td>
</tr>
<tr>
<td>Single Shot</td>
<td>29</td>
<td>100%</td>
</tr>
</tbody>
</table>

Tabel no 5. The site and Direction of the Suicidal Gunshot Wound.

<table>
<thead>
<tr>
<th>Site</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right Temple</td>
<td>25</td>
<td>86.2%</td>
</tr>
<tr>
<td>Left Temple</td>
<td>2</td>
<td>6.9%</td>
</tr>
<tr>
<td>Right Parietal</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Left Parietal</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Forehead</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Chin</td>
<td>2</td>
<td>6.9%</td>
</tr>
<tr>
<td>Mouth</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Chest</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Abdomen</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Right to Left</td>
<td>25</td>
<td>86.2%</td>
</tr>
<tr>
<td>Left to Right</td>
<td>2</td>
<td>6.9%</td>
</tr>
<tr>
<td>Below upwards</td>
<td>2</td>
<td>6.9%</td>
</tr>
<tr>
<td>Upwards</td>
<td>19</td>
<td>65.5%</td>
</tr>
<tr>
<td>Horizontal</td>
<td>7</td>
<td>24.1%</td>
</tr>
<tr>
<td>Downwards</td>
<td>1</td>
<td>3.4%</td>
</tr>
<tr>
<td>Forwards</td>
<td>29</td>
<td>100%</td>
</tr>
<tr>
<td>Backwards</td>
<td>00</td>
<td>0%</td>
</tr>
<tr>
<td>Ricocheting</td>
<td>2</td>
<td>6.9%</td>
</tr>
<tr>
<td>Contact</td>
<td>9</td>
<td>31%</td>
</tr>
<tr>
<td>Near Contact</td>
<td>20</td>
<td>69%</td>
</tr>
</tbody>
</table>

Tabel no 6. The Crime Scene Examination and Evidence Collected.

<table>
<thead>
<tr>
<th>Character</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intact Surroundings</td>
<td>26</td>
<td>89.7%</td>
</tr>
<tr>
<td>Disturbed Surroundings</td>
<td>3</td>
<td>10.3%</td>
</tr>
<tr>
<td>Weapon in hand</td>
<td>2</td>
<td>6.9%</td>
</tr>
<tr>
<td>Weapon at scene</td>
<td>29</td>
<td>100%</td>
</tr>
<tr>
<td>Empty Shells</td>
<td>29</td>
<td>100%</td>
</tr>
<tr>
<td>GSR/Swabbing</td>
<td>29</td>
<td>100%</td>
</tr>
<tr>
<td>Suicide notes</td>
<td>2</td>
<td>6.9%</td>
</tr>
<tr>
<td>Alcohol/Drugs</td>
<td>8</td>
<td>27.6%</td>
</tr>
<tr>
<td>Medication</td>
<td>2</td>
<td>6.9%</td>
</tr>
<tr>
<td>Crime Scene Disturbed</td>
<td>11</td>
<td>37.9%</td>
</tr>
</tbody>
</table>

RESULTS:

1. A total of 29 cases were studied during this period of study. Male contributed to the large majority of the Victims. The Male to Female ratio was 13.5:1.
2. Majority of the Victim belonged to the aged group 21-40yrs. The least affected were from the age group of 51-60yrs. The Children and Old individual were never affected.
3. All the Victims used Hand guns and all the Weapons were Legally purchased under a valid License.
4. This table highlights the Characters of a Suicidee. 93.1% of the victims were Right Handed and Majority of the victims preferred Place of Residence in 96.6% of cases to commit the act. In 86.2% of victims the Clothes were clothed during the act. In 27.6% of the victims Alcohol and Drugs were traced during the act of Suicide. The major triggering factor in 79.3% of cases were Marital or Relationship related issues. In 6.9% of cases Suicidal notes were present at the Crime Scene. All the Victims died due to Single Shot and Large majority of the incidence [93.1%] reported between 8pm to 2am.
5. The most preferred site was the Right Temple in 75.9% of cases ,the Chin and Left Temple sites were each preferred in 6.9% of cases. Majority of the Suicidee shot from a Near Contact Range in 69% of cases and only in 31% of cases were shot in Contact Range. The Large majority of the Shots were directed Right to Left in 86.2% of cases and only in 6.9% of cases it was directed below upwards and this were specific to the
Shots situated over the Chin. The Majority of the Shots were directed upwards in 65.5% of cases, followed by those directed Horizontally in 24.1% cases. All the Shots were forced forward. In 6.9% of cases the Bullet fragmented and Ricocheted after hitting the body changing the direction of the exit.

6. The Empty shell from the scene was recovered in all the cases. The CCTV footage was also available in all the Cases. Swabbing of the Hands were done in all the victims. The surroundings were undisturbed in 89.7% of cases. In all the cases the Weapon was recovered from the Crime scene but in only 6.9% of cases the weapon was found in the hand. The evidence of consumption of Alcohol/Drugs was available in 27.6% of cases. Evidence of Medication usage was available in 6.9% of cases. In 37.9% of cases the Crime scene was Disturbed before the Arrival of the Investigators and Forensic Pathologist.

DISCUSSION:

Suicides are not uncommon. There are many methods of Committing Suicides of which, Hanging, Pesticides, Poisoning and Firearms are widely reported. Firearm related Suicides are common in regions where the Availability and accessibility to Firearms is well Established. A strong associations between Rate of Gun Ownership and Gunshot suicides have been well Established recommending Firearm Legislation. In the present study similar observation was made wherein all the Victims had valid License with easy access to the Weapon. In the Present study a Total of 29 cases of Suicides due to Firearm was studied other Category like Accidental Self Injury and Murder-Suicide due to Firearm were Excluded from the present Study. Of the 29 cases Male contributed to the large majority [n=27] of cases with the Male to Female ratio of 13.5:1. This results were close to the observations made by Nikolic. S. et al[2012], Canturk.G. et al[2009] and Avis. SP. Though, however they differed from this study due to their Large number of the Cases. The Major age group involved were victims aged between 21-40yrs, this results are similar to those claimed by Bluementhal R.[2007], however the Results differ from the observation made by Nikolic. S. et al[2012], he concluded the average age as 47[+/- 19.1yrs] but the Claims made by Asirdizer M[2010] was contrary to this, he had claimed that his victims belonged to the age group 16-20yrs. Hand Gun were the preferred Weapon in all the Cases of Gun Suicides in the present study, this results are close to the observation made by Bluementhal R.[2007], he opined that 96% of his victims preferred Handguns. The Majority of the victims in this study were right handed[93.1%] and 96.6% of the victims preferred in House to commit the Act, this observation were similar to the claims made by Bluementhal R.[2007] and closer to the observations made by Asirdizer M[2015] and Druid H[1997]. In 27.6% of victim Toxicological analysis were positive for Alcohol in this study contrary to the observations made by Bluementhal R.[2007], he had opined that 40% of his victims reported Positive Blood Alcohol. Marital or Relationship Crisis were the major Motivating Factor in 79.3% of victims, the other factors were Financial[13.8%] and Domestic[6.9%] in nature this observations were not made by similar studies done elsewhere. Of the 29 victims only 6.9% of the Victims had past history of Psychiatric Illness, a claim disputed by observations made by Druid H[1997], he claimed Majority of his Victims had past history of Psychiatric Illness. It is not uncommon for a Suicidee to write before his act, in the present study only 6.9% of the victims had preferred to leave a Suicidal Note the observations are close to those made by Asirdizer M[2010][15], he had found 9.6% of his Victims with Suicide Note in the present study. 86.2% of the victims clothes were intact and 93.1% of the Victims committed the act between 8pm to 2am. This observations were not recorded by similar studies elsewhere. Since the preferred Anatomical site of Suicidee is other than the Clothed area i.e the Head, the victim had preferred not to undress before the act. the other possibility of extreme stress during the time of the act cannot be ruled out. All the victims died due to a single shot whereas Canturk.G. et al[2009] had observed 3.6% of his victims had Two Shots. In this study 93.1% of the victims the Head was the preferred region for the Gunshot and only 6.9% of the victims preferred the Face[chin]. Similar were the views of Bluementhal R.[2007], Avis.SP and Balc Y et al. The most preferred Anatomical Site on the head was the Right Temple in 86.2% of the Victims similar were the views of Bluementhal R.[2007], however these views were contrary to the claims made by Nikolic. S. et al[2012] who observed that Mouth[16%], Forehead[7%] and Left Temple[6%] involved and only 67% of his victims preferred the Right Temple. In the present study 6.9% of the victims preferred Left Temple, an observations similar to Nikolic. S. et al[2012]. The contrary observations were made by Asirdizer M[2015] who claimed that half of his Male victims preferred Abdomen region. In this study...
the wounds track were directed forwards and in 86.2% of the victims it was directed Right to Left and directed upwards in 65.5% and Horizontal in 24.1%. This observation are close to those made by Bluementhal R.[2007]14 however he claimed that only 51% of his victims had the track directed upwards, though his study group was larger[n-406] than the present study. In this study the Bullet Ricocheted and fragmented in 6.9% of the cases changing the course of the Exit wound. The Range of the Shot fired in the Present Study were Contact Range in 31% of Victims and Near contact or Loose Contact in 69% of Victims these are close to the claims made by Bluementhal R.[2007]14, Canturk.G. et al[2009]12, Strijina V18 and Karger B.19, they claimed that 81-89% of their victims had Contact or near contact gunshots. However in the study conducted by Balc.Y et al17 and Asirdizer M[2010]15 only 72-76% of the Victims inflicted Contact or Loose contact Gunshots. The Crime scene an important part of Investigation was examined in all the cases. The Weapon and Spent Shells were recovered in all cases. The, Gunshot shot Residue Swabbing of hands and finger prints was done in all the cases. In 6.9% of victims the Weapon was held firmly in the hand. In 89.7% of the Cases the Surroundings were intact and in 37.9% of cases the though the surroundings were intact the Scene was disturbed in the guise of Assisting the Victim and Emergency Measures. The Crime scene also helped to recover the Suicide notes in 6.9% of cases. Hence the visit to the Crime Scene by the Doctor is of utmost importance in cases of Suspected Suicides by Gunshot, other evidence materials like the Telephonic details and Electronic surveillance plays an important role in corroboration of the Circumstances. Other aspects besides Autopsy like the Ballistic Examination is vital in arriving at the exact manner of Death. Hence this study highlights the importance of Combined approach, consisting of Crime Scene Findings, Circumstances, Autopsy, Toxicological and Ballistic examination results in differentiating between Suicidal Gunshot wound to Homicidal and Accidental manner of deaths. similar are the recommendations of Cave R[2014]20 and Kunz SN[2013]21.

CONCLUSIONS:

1. Males Form the Large Majority of Suicidal Victims due to Gunshot wound, with a Male to Female Ratio of 13.5:1.

2. All the Victims had Easy Accessibility to the Firearm.

3. All the Victims used Handgun to commit the act.

4. Majority of the Victims belonged to the age group 21-40yrs.

5. Large majority of Victims[96.7%] preferred in House to commit the act.

6. Marital/Relationship Crisis were the Major Motivating factors in 79.3% of cases.

7. Psychiatric Illness contributed to only 6.9% of cases.

8. In 93.1% of the Victims the Head was the most preferred region and Temple was the most preferred Anatomical Site.

9. The wounds track were directed forwards and in Majority[86.2%] of the wounds were directed Right to Left, upwards in 65.5% and Horizontal in 24.1%.

10. A combined approach including Circumstances, Crime scene examination, Autopsy, Ballistic examination is important to arrive at the exact Manner of death in Gunshot Suicides.

ACKNOWLEDGEMENTS:
MNS, Kingston. Legal Medicine Unit., Forensic Science Institute, Jamaica. JCF, Jamaica.

CONFLICT OF INTREST:
Author declares no Conflict of interest.

REFERENCES:


9. Miller, M; Azrael, D; Barber, C (April 2012). "Suicide mortality in the United States: the importance of attending to method in understanding population-level disparities in the burden of suicide". *Annual review of public health* 33: 393–408.


PHOTOGRAPHS:

Pic 01. Showing Gunshot wound over the Right Temple.
Pic 02. Gunshot wound above the Right Ear.

Pic 03. Gunshot wound across the front of Ear.

Pic 04. Showing Blackening over the Right Temporal Bone in Contact Suicidal Gunshot Wound.