Paramedic Suicide with Vecuronium Bromide – A Case Report

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Abstract
Skeletal muscle relaxants are drugs that act peripherally at neuromuscular junction/ muscle fiber itself or centrally in the cerebrospinal axis to reduce muscle tone and/or cause paralysis. The neuromuscular blocking agents are used primarily in conjunction with general anesthesia to provide muscle relaxation for surgery, while centrally acting muscle relaxants are used mainly for painful muscle spasms and spastic neurological conditions. Skeletal muscle relaxants are rarely used as suicidal agents to commit suicide. These drugs are not easily accessible for common public. Staffs working in operation theatre have easy access to these groups of drugs. Here, we report a case of a staff nurse who committed suicide by injecting herself with two ampules of Vecuronium bromide due to personal conflict with the Surgeon in Operation Theater.

Keywords
Vecuronium bromide; Suicide; Paramedic; Operation theater

Introduction
The classical neuromuscular blocker, Curare, was the tool that Claude Bernard used in the mid-19th century to demonstrate a locus of drug action at or near the neuromuscular junction. Modern day neuromuscular blocking agents fall into two clauses, depolarizing and non-depolarizing/ competitive [1].

Vecuronium bromide (Figure 1) is an intermediate acting non-depolarizing (competitive) blocker. It is a close congenor of pancuronium (Figure 2) with a shorter duration of action. Vecuronium is pancuronium minus a quaternary methyl group. This minor structural change beneficially alters the side effects without affecting the potency. At physiologic PH, the tertiary amine is largely protonated, as it is in dTC (d-tubocurarine). Pancuronium and Vecuronium are very similar in structure, yet Vecuronium is prepared as a lyophilized powder. Recovery is generally spontaneous not needing Neostigmine reversal, unless repeated doses have been given. Cardiovascular stability in Vecuronium is still better due to lack of histamine releasing and ganglionic action [1-4].

All neuromuscular blockers are polar quaternary compounds not absorbed orally, do not cross cell membranes, have low volumes of distribution and do not penetrate placental or blood-brain barrier. The dose of Vecuronium bromide is 0.08-0.1 mg/kg, with onset at 2 – 4 min and duration of action of 30 – 60 min [1-4]. Vecuronium is metabolized to a lesser extent by the liver. It depends primarily on biliary excretion and secondarily (25%) on renal excretion [1-4].

Case details
History
As per the inquest by Madiwala Police station, a case was booked under Section 306 I.P.C (Indian Penal Code) on 06/03/2011 for alleged history of injecting Vecuronium bromide compound in the Operation Theater. The deceased was a 24yrs old staff nurse, who had taken 4 ampules of Vecuronium from the Operation Theater and went into a room and injected herself with two ampules of Vecuronium bromide. Autopsy was done at Department of Forensic Medicine and Toxicology, Bangalore Medical College and Research Institute, Bengaluru, India on 06/03/2011.

Autopsy finding
The dead body was that of a female measuring 162cm in length, moderately built and nourished. Rigor mortis was appreciated all over the body. Post-mortem staining was present over the back of the body. Lungs – Congested and edematous; cut section exudes blood mixed with froth. Stomach – empty; normal mucosa; no unusual smell.
the other organs were intact and congested. Blood, viscera and skin along with subcutaneous tissue (injection site and control) collected; sent to Forensic Science Laboratory for chemical analysis.

**Forensic science laboratory report**

1. High performance thin layer chromatography and LC-MS-MS methods have responded for the presence of Vecuronium Bromide in blood and injection site of the skin.

2. The quantum of Vecuronium bromide is 0.6223 μg/liter of blood.

3. The methods have responded negative for Vecuronium in stomach and other viscera.

   It may be noted that following the administration of Vecuronium bromide (0.08-0.1 mg/kg) neuromuscular blockade begins within 1 minute and is maximum by 3-5 min. In this process, 60-90% of the drug is bound to plasma protein. Therefore the quantified value of Vecuronium bromide refers only to the unbound Vecuronium bromide.

**Cause of death**

The cause of death was opined as Respiratory failure as a result of injection of Vecuronium bromide.

**Discussion**

Here, we report a case of a paramedic who committed suicide by injecting herself with Vecuronium Bromide. The deceased was a staff nurse working in a Tertiary care Hospital. On conflicts with the Surgeon in the Operation Theater, she had taken 4 ampules of Vecuronium bromide (each ampules contain 4 mg strength) to a nearby room and had injected herself 2 ampules of it. Later, she was found unconscious in that room. Very few cases have been reported in literature regarding suicides with Vecuronium bromide. Ohata H et al., reported a case of overdose of Vecuronium during general anesthesia to an infant. Masui 54: 298-300.


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