

Original Article

# Brain Stem Anaesthesia Following Regional Anaesthesia for Cataract Surgery at A Teaching Hospital in Nigeria

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## Article History

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## ABSTRACT

Regional block for ophthalmic anesthesia in cataract surgery is a long practice that is known to be safe and effective. However, the first rare life-threatening complication since the inception of the department, brain stem anesthesia is presented. Presented here is case of a 70-year old male patient with bilateral dense cataracts in both eyes, blood pressure 120/85mmHg, regular full volume pulse, fasting blood sugar 5.4mmol/l and Hb 14g/dl was to have cataract surgery. Anesthetic nurse administered peribulbar anesthesia with 5 ml of xylocaine with adrenaline and hyalase using 25mm 21G needle, and at 5 minutes, full akinesia, and complete ptosis was achieved. The patient was, cleaned, and draped but suddenly became apneic, confused, and was not responding to command, BP was 85/35mmHg and pulse barely palpable 40/min. Immediate cardiac massage, secured airway, IV line with normal saline, and later alternate with dextrose saline was commenced. Consciousness deteriorated more, ambubaging was applied after 20 minutes, and consciousness improved, BP 90/40mmHg, volume stronger, apneas ceased and breathe 60 cycles per minutes. At 30 minutes BP was 110/80 mmHg, pulse 70/minutes better volume and the patient was beginning to obey command. The patient was transferred to the observation unit by next day patient was fully conscious with the return of vital signs to normal. Preventive and management measures must be put in place against this life threatening complication.

**Keywords:** Anaesthesia, brainstem, Cataract, complication, lifethreatening, ophthalmic peribulbar, retrobulbar.

## INTRODUCTION

Most surgeries involving the cornea, anterior chamber, and lens can be performed with local anaesthesia because it achieves full akinesia and analgesia that is vital for surgery success. Regional block; peribulbar and retrobulbar were first described in the year 1884 and is the practice in our center were all cataract operated eyes are done except in pediatric cases or adults that cannot withstand it. This high

success and relative free serious complications has made most cataract surgery centers ill equip to handle serious local anesthetic complications. The first major and life-threatening complication of this procedure we have ever encountered since cataract surgeries are performed in over 15 years is brain stem anesthesia and is presented.

CASE a 70-year male patient presented to our clinic with bilateral dense cataracts in both eyes and had no

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history suggestive of any general medical or surgical condition. Blood pressure was 120/85mmHg; pulse regular full volume, fasting blood sugar 5.4mmol/l and Hb 14g/dl. A trained ophthalmic anesthetic nurse administered peribulbar anesthesia with 5 ml of xylocaine with adrenaline and hyalase using 25mm 21G needle after aspirating with no sign of blood in the syringe. He applied pressure with Honan's balloon and full akinesia, and complete ptosis was achieved in 5 minutes. The patient was moved to the operation table, cleaned, and draped. Suddenly became confused, apneic, and was not responding to commands, BP was 85/35 mmHg, pulse was barely palpable at 40/min. We immediately commenced cardiac massaging and secured the airway and intravenous line with normal saline. However, consciousness deteriorated more but we continued cardiac massaging with ambubaging and after 20 minutes, consciousness improved as the patient was beginning to respond to calls, BP 90/40mmHg, pulse volume stronger, apneas ceased and breath was 60 cycles per minute. At 30 minutes BP was 110/80 mmHg, pulse 70/minute better volume and the patient was beginning to obey commands. Then moved to the observation unit and in 3 hours the patient was fully conscious with return of vital signs to normal and was discharged the next day.

## DISCUSSION

Ophthalmic anaesthesia started with Carl Koller in 1884 when <sup>1</sup> cocaine drop was applied directly to the surface of the eye. later descriptions of retrobulbar <sup>2</sup> and sub-Tenon <sup>3</sup> anaesthesia followed and of late was peribulbar injection by davies and Mandel in 1986.<sup>4</sup> A good method of anaesthesia technique produces absent ocular movements, good analgesia <sup>5,6</sup> and associated complete ptosis. Peribulbaranaesthesia has become popular because it provides all these and is injected into the extraconal space causing fewer complications of the optic nerve and sclera perforation found in the retrobulbar block.<sup>7,8</sup> Unlike in developed countries where the practice of cataract surgeries are shifting towards topical anaesthesia, in our center peribulbar is still popular because we have yet advanced to the 3mm clear corneal phaco incisions that use topical medications with highly technical types of equipment like phaco machines.

Although peribulbaranaesthesia is safe but not absolutely free of complications. The commonly associated complications are; chemosis, conjunctival hemorrhage, and pain then the rare; ecchymosis, ptosis, extraocular muscle and optic nerve injury, retrobulbar hemorrhage, globe penetration, and brain-stem anaesthesia <sup>9,10</sup>. Some of the rare complications are sight-threatening, such as peri/retrobulbar hemorrhage that occurs in 1-3% <sup>11</sup> and it causes raised IOP, orbital compression, and impairment of ophthalmic artery circulation and the second is globe penetration occurs in 1:1,000-1:12,000 <sup>12</sup> and risk is about 30 times more with myopia. However, the serious sight and life-threatening complications are a rare occurrence 0.07% but have 2.5% increased risk than sub tenons.<sup>10</sup>

BSA is a serious systemic complication of Regional Anaesthesia that is dreaded by every ophthalmic surgeon or anesthetist. It was reported by Nicoll et al to have a prevalence of 0.27% (1 in 375) with life-threatening complications of 1 in 700 following retrobulbaranaesthesia. <sup>13</sup> This could be less with peribulbaranaesthesia for reasons that the needle is short and delivers the drug to the extra conal space and fewer chances of entry into the optic nerve and artery. Even though, the two are blind procedures and also share spaces, it has been suggested that one cannot be completely certain that the blockade is really intra- or extraconal.

In the reviewed patient there was respiratory arrest, bradycardia, hypotension and deteriorating consciousness, which are presentations of BSA. There are two ways for BSA to occur after peribulbar block; injections with drugs directly delivered into the vasculature or into the subarachnoid space of the meningeal sheath around the optic nerve.

In the vascular route of BSA, routine injection through the inferiorly lateral 1/3<sup>rd</sup> to the extraconal space inadvertently delivers the drug directly into an anomalous inferior ophthalmic artery that lies inferior to the ophthalmic nerve in 15% of cases. <sup>14</sup> This gets to the thalamus and other midbrain structures by retrograde flow into the internal carotid artery. This route seems unlikely in the patient reviewed because on injection, attempted aspiration before delivery of the drug was free of bloodstain suggesting there was

no entry to the vasculature. The other likely route was through the meningeal sheath, a covering of the brain that extends on the optic nerve into the orbit. This contains a transparent fluid the CSF which when entered the aspirated in the syringe may not show changes and be difficult to avoid instillation of drugs. Through this and its spreads to the brain stem. In our patient, symptoms manifested about 8 minutes of injection which is consistent with findings that BSA is known to occur within 10 minutes of injection.<sup>13</sup>

Though clinical presentation of our case was more of respiratory and cardiovascular, it has been reported that in severe cases, presentations involve convulsions, aphasia, nerve palsies, hemi or paraplegia, and respiratory problems.<sup>15</sup> These presentations are the determinants of treatment offered to patients with BSA. Once BSA occurred, treatment ranges from basic to advanced life support and other specific systems involved. These include monitoring vital signs most importantly oxygen saturation, intravenous fluids for circulation support, airway and respiration support which in severe cases involves intubation and use of ventilators. In the reviewed patient, we instituted only basic life support and the patient's condition improved in 10 minutes and eventual full recovery in 12 hours.

It is therefore necessary that preventive measures be instituted in reducing the risk of BSA. This can be achieved by using a blunt tip not more than 31mm long needle because 11% of optic nerves can easily be perforated with needles measuring 38 mm in length and performing a wiggle test.<sup>16</sup>

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