Anesthesiology
67:861, 1987

The Correct Position of the Head and Neck for Rapid Sequence Induction

To the Editor:—Goldberg[1] raised a very important question about the proper position of the head and neck for rapid sequence induction in a patient with a "full stomach." Should it be full extension of the head and neck, as Sellick[2] described, or can it be sniffing position (where the neck is flexed forward and the head is extended backward)?

When Sellick introduced the manuever of cricoid pressure, he suggested that the patient lie supine with a slight head-down tilt with the head and neck fully extended. This position increases the anterior convexity of the cervical spine, stretches the esophagus, and prevents its lateral displacement when pressure is applied to the cricoid.

The lateral x-ray of the head and neck of a normal subject in either sniffing position[3] or full head and neck extension[2] shows that the anterior convexity of the cervical spine is about the same. This implies that extension of the head plays a major role in forming the anterior convexity of the cervical spine. The esophagus commences in the median line, at the upper border of the cricoid cartilage, opposite the intervertebral disk between the fifth and sixth cervical vertebrae.[4,5] The muscular coat of the esophagus is composed of external longitudinal and internal circular fibers. The longitudinal fibers are attached to the posterior surface of the cricoid cartilage and the fibers of the inferior constrictor. The origin of the esophagus is also the first of four constrictions. This is produced by the tonic contraction of a specialized band of the circumferential fibers of the lowermost portion of the inferior pharyngeal constrictor muscle, called the cricopharyngeus muscle.

As the result of this anatomical relation, the esophagus is fixed to the cricoid cartilage ring, and is always posterior to it. Thus, we need not worry about lateral displacement of the esophagus, which is also stretched when the head is extended (the larynx moves cephalad when the head is extended), and the esophagus should be occluded when pressure is applied on the cricoid cartilage against the cervical spine.

Therefore, I believe that the correct position for rapid sequence induction is the sniffing position. This position will both facilitate endotracheal intubation and provide all that Sellick wanted to achieve.

DUNG O. TRAN, M.D.
Instructor
Anesthesia Section, Clinical Center
National Institutes of Health
Bethesda, Maryland 20892

REFERENCES

1. Goldberg JS: What is the correct position of the neck for rapid sequence induction in a patient with a full stomach? ANESTHESIOLOGY 66:558, 1987
2. Sellick BA: Cricoid pressure to control regurgitation of stomach contents during induction of anesthesia. Lancet 2:404–406, 1961
3. Dripps RD, Eckenhoff JE, Vandam LD: Intubation of the trachea, Introduction to Anesthesia, 5th edition. Philadelphia, WB Saunders, 1977, pp 216–230.
4. Netter FH: Digestive system Part I, The Ciba Collection of Medical Illustrations, Vol. 3. New York, Ciba Pharmaceutical Company, 1971, pp 17–23
5. Gray H: The organs of digestion, the esophagus, Anatomy, Descriptive and Surgical, 1901 edition. Philadelphia, Running Press, 1974, pp 891–893

(Accepted for publication July 12, 1987.)

Anesthesiology
67:861–862, 1987

Ketamine Addiction

To the Editor:—There is a potential of developing tolerance to ketamine, but reports of ketamine addiction or dependence are few. We would like to report the case of an individual who has been taking ketamine for 5 yr and has developed dependence to the drug.

A 31-yr-old white male voluntarily registered in the detoxification program for chemical dependence. While waiting in the outpatient clinic, he chanced a last "farewell" injection of 300 mg ketamine, im, before being admitted to the program. Loss of consciousness in a public area promptly attracted the attention of hospital personnel. A half-empty, 10-ml ketamine bottle was found in his pocket, and an anesthesiologist was consulted concerning emergency treatment of ketamine overdose. The patient regained consciousness and related the following story.

He began taking ketamine 5 yr earlier while working in an operating room. Initially, this was limited to mixing the drug in a soda drink. During the first 2 yr, his drug consumption gradually increased from occasional 50-mg doses to 500-mg doses, four to five times a day. The large dose of oral ketamine intake caused epigastric pain, "stomach clump," as he called it, which was controlled by 10 mg metoclopramide (Reglan) by im injection. Two years later, the patient switched from oral intake to intramuscular injections, both because of the unpleasant taste with a large dose and to get an effective response with a small dose. Within a month, he was injecting 300–750 mg, im, five to six times daily (6–15 ml of 5% solution) using a 25-gauge needle into the anterior thighs and the deltoid muscles. After injection, he experienced slight hallucinations characterized by colorful kaleidoscopic pictures, double vision in the central visual field, and blurred and distorted vision in the peripheral field, slow speech, transient amnesia for less than 5 min, and a loss of bodily balance. The duration of drug action became shorter as his tolerance increased. Even with a 750-mg injection (the maximum dose in this case), the drug effect lasted only 15–20 min. Within 1 h from the time of injection, he felt normal in his visual and motor functions, but he felt mild weakness for 2–3 h following each injection. Appetite and weight loss (about 30 pounds) occurred during the period of heavy usage. Although he took ketamine during his regular duty hours, it was never noticed. During the 5-yr period, he discontinued the use of ketamine on two occasions for a half year each. Stopping the habit was extremely difficult, but did not cause any physical withdrawal syndrome. The tolerance to ketamine quickly dissipated after cessation of the drug use; however, on restarting the intramuscular injections, his tolerance developed at the same rate as during the first episode; a month to reach the maximum tolerance.

Subsequently, the patient was admitted to an alcohol/drug detoxification program and received appropriate counseling and rehabilitation.

Development of high tolerance to ketamine after repetitive therapeutic doses has been reported,[1,2] but reports of ketamine addiction are few.[3] Addiction to this drug is characterized by development of strong psychological or mental dependence. Withdrawal from ketamine in this case did not involve physical pain or agony. Ketamine addiction is seldom detected because of the short duration of the drug action when tolerance has developed and minimum physical effects. Existence of long-term effects of ketamine on the central nervous system is not clear.[4] Oral ketamine has been described as an alternative method of administration.[5–7] Since ketamine is not a controlled substance, pharmacists and anesthesiologists tend to pay less attention to inventory of the drug.

This case report suggests that ketamine is capable of causing mental and psychological dependence, and should be considered the same as a controlled substance.

HIROSHI KAMAYA, M.D.
P. R. KRISHNA, M.D.
Department of Anesthesiology
University of Utah, College of Medicine
and
Anesthesia Service
Veterans Administration Medical Center
500 Foothill Drive
Salt Lake City, Utah 84148

REFERENCES

1. MacLennan FM: Ketamine tolerance and hallucination on children. Anaesthesia 37:1214–1215, 1982
2. Byer DE, Gould AB Jr: Development of tolerance to ketamine in an infant undergoing repeated anesthesia. ANESTHESIOLOGY 54:255–256, 1981
3. Ahmed SN, Petchkovsky L: Abuse of ketamine. Br J Psychiatry 137:303, 1980
4. Schorn TOF, Whitwam FG: Are there long-term effects of ketamine on the central nervous system? Br J Anaesth 52:967–968, 1980
5. Morgan AJ, Dutkiewicz TWS: Oral ketamine. Anaesthesia 38:293, 1983
6. Hain WR: Oral ketamine. Anaesthesia 38:810–811, 1983
7. Grant IS, Nimmo WS, Clements JA: Oral ketamine. Anaesthesia 39:66–67, 1984

(Accepted for publication July 20, 1987.)