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RESPİRATORY DEPRESSİON ASSOCİATED WİTH THE USE OF OPİOİDS AND AMPHETAMİNES

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ABSTRACT

Opioids play an important role in pain management, and there is increasingly widespread use. Despite this extensive use, it must not be forgotten that these drugs have significant side-effects. Opiates have central and peripheral effects. The central effects reduce the perception of pain by stimulating opiate receptors (analgesic effect), reduce mental activity (sedative effect), eliminate anxiety (tranquilising effect), improve mood (euphoric effect), inhibit the respiratory and cough centres (respiratory depressant and antitussive effect) and cause the development of tolerance and dependence. There is increasing abuse of opioid analgesics among healthcare personnel and the reason for this could be the ease of accesibility. The case is here presented of a 23-year old nurse who was intubated following respiratory arrest while on duty in our clinic. Substance use was determined and the patient was admitted to the Intensive Care Unit for close monitoring and treatment. With improvement in the clinical condition, the patient was transferred on the 2nd day to the Alcohol and Substance Dependence Treatment Centre (AMATEM).

KEYWORDS: Respiratory depression, opioid, miosis.

INTRODUCTION

Opioids play an important role in pain management[1], and there is increasingly widespread use. Despite this extensive use, it must not be forgotten that these drugs have significant side-effects.[2] Opioid analgesics (narcotics) include pharmacologically opium or morphine type drugs. Analgesia is provided without an antipyretic or anti-inflammatory effect. They are indicated for short-term use in patients with acute severity or moderate severity pain and for long-term use in cancer patients with chronic pain.[3]

The rates of opioid analgesic abuse, especially among healthcare workers, are thought to be higher than the reported rates.[4] The reason for this is the ease of accessibility to the drugs by healthcare workers, and in this sense they are not aware that they are engaging in criminal activities and that this is a source of serious problems in the clinics where they are working.[5,6]

CASE

A 23-year old nurse on duty in our clinic was found unconscious with shallow breathing. She was immediately monitored. Temperature was 36.6˚C, heart rate was 60 bpm, arterial blood pressure was 80/50 mmHg, SpO_2 was 86% and the pupils were myotic. Oxygen support was given, a vascular route was opened and fluid support was provided. The patient had no pain response and with the development of respiratory arrest, intubation was performed. GCS was E1M1 V-intubated. The patient's colleagues were questioned as to whether she had any disease for which she was using any drugs or other substances. The information received was that she had no illness and was not taking any medication. Radiology, biochemistry and toxicology tests were performed. The patient was admitted to the Intensive Care Unit (ICU) for close monitoring and treatment. The necessary permits hae been obtained for all the procedures to be performed by the patients and their relatives.

The patient was followed up on a mechanical ventilator in SMIV mode. In the detailed physical examination, numerous needle entry marks were observed in both shoulder regions. It was reported by colleagues that an empty syringe had been found in the bathroom used by the patient and a remifentanil vial was found among her possessions. Considering intoxication associated with opioid abuse, 1 ampoule of naloxone was administered intravenously. According to the toxicology results (biochemistry drug levels – Table 1), opioid and amphetamine had been taken, so a second dose of naloxone after 1 hour. The patient was observed to be hypotensive during the follow-up, then arterial pressure and body temperature started to increase. When arterial pressure was 160/90 mmHg, a Perlinganit infusion was started. When body temperature reached 38˚C, cold packs were applied.

Table 1: The Laboratory Tests of the Patient.

Test	Admıssıon	Dıscharge
Glucose (mg/dL)	140	123
Urea (mg/dL)	20	23
BUN (mg/dL)	9	11
Creatinine (mg/dL)	0.76	0.75
AST (IU/L)	23	19
ALT (IU/L)	16	11
Na (mmol/L)	144	145
K (mmol/L)	4.14	3.99
Ca (mg/dL)	8.6	8.7
Mg (mg/dL)	1.74	1.99
CRP (mg/dL)	0.21	1.04
Ph	7.25	7.49
PaO_2 (mmHg)	63.2	150
$PaCO_2$ (mmHg)	41.7	31
HCO_3	17.4	23
Sat	86.4	99.1
Beb	-7.9	0.2
Opioid (ug/L)	14373	134
Amphetamine (ug/L)	690	74

On the thoracic CT, bilateral mild pleural effusion was observed and adjacent areas of atelectasis -nodular consolidation. The brain CT was evaluated as normal. After 12 hours, the patient sedation was terminated. Arterial blood gases and level of consciousness returned to normal and the patient was extubated. The Perlinganit infusion was reduced and terminated 1 day later. The patient was referred to the Psychiatry Department. The clinical condition improved and on the recommendation of the Psychiatry Department, the patient was transferred to the Alcohol and Substance Dependence Treatment Centre (AMATEM) on the 2nd day.

This case of a healthcare worker who developed respiratory arrest associated with substance abuse while on duty in hospital is presented to draw attention to narcotic drug use in hospitals.

DISCUSSION

Opioid analgesics (narcotics) pharmacologically encompass opium or morphine-like drugs. They provide analgesia without an antipyretic or anti-inflammatory effect. They are indicated for short-term use in patients with acute severity or moderate severity pain and for long-term use in cancer patients with chronic pain.[3]

Opiates have central and peripheral effects. The central effects inhibit the respiratory and cough centres (respiratory depressant and antitussive effect), initially causing nausea and vomiting (emetic effect), then later inhibit the emetic centre (anti-emetic effect), cause myosis (myotic effect), mobilise antidiuretic hormone output (antidiuretic effect), and cause the development of tolerance and dependence. The peripheral effects cause pyloric contraction and delayed peripheral gastric evacuation, reduce gastrointestinal motility, increase tonus (spastic constipation), cause bile duct muscle contraction, increase bladder muscle tonus, reduce vascular tonus, increase the risk of orthostatic reaction, increase the incidence of itching, urticaria and skin reactions because of histamine exposure and cause progression of bronchospasmin asthma.[7]

In the current case, when the condition was first noticed, the patient was unresponsive to verbal and pain stimuli, hypotensive, bradycardic and the pupils were myotic, then respiratory arrest developed.

Naloxone is a full antagonist, which blocks all the mu, kappa and delta receptors. It antagonises the effects of morphine and similar analgesics. As the effect is short-lived, doses are repeated every 20-60 minutes. When used at the usual dose (2mg), there is no significant side-effect. It does not create tolerance and dependence.[7] When it was determined that the current patient had taken opioids, 2 doses of naloxone ampoule were administered at intervals as opioid antagonist. As the patient did not recover consciousness or muscle strength, the second dose was repeated. After the second dose, the patient started to recover consciousness and there was no need for an additional dose of naloxone.

Amphetamines are strong psychostimulants which produce increased energy, awareness, insomnia, and confidence, associated with heightened mood, sense of well-being and euphoria, in addition to increased fatigue and appetite. At high doses, they can cause contractions, stereotypical movements and psychosis. When the effects wear off, tiredness and anxiety can be seen.[8,9] These negative symptoms of the “come-down” can be seen as greater levels of fatigue, depression and lethargy when higher and repeated doses are taken. Long-term amphetamine use is characterised by psychotic reactions, hallucinations and paranoia, known as “amphetamine psychosis”. Amphetamines have high potential for abuse, causing dependence, tolerance and withdrawal symptoms.[10] The effects of amphetamines at the peripheral level include increased systolic and diastolic blood pressure, mydriasis,

shivering, sweating, jaw clenching, dry mouth and restlessness. These events are mediated by the release of norepinephrine which directly causes sympathomimetic stimulation.[10,11]

When the current patient was first noticed, she was hypotensive. After the opioid effect, she was seen to be hypertensive and tachycardic with the amphetamine effect. A Perlinganit infusion was started. When the clinical condition of the patient improved, the Psychiatry Department was consulted, and on their recommendation, the patient was transferred to the Alcohol and Substance Dependence Treatment Centre (AMATEM) on the 2nd day after admission to ICU.

In our ICU, the storage and usage of narcotic drugs is carried out in accordance with quality standards and instructions. However, even if stringent precautions are taken in these types of areas, it is not possible to prevent personnel with a tendency for substance abuse from coming into contact with these drugs. There is a need for further preventative measures to be taken for ICU staff who are working under difficult conditions. The provision of psychiatric therapy at regular intervals could indicate those suspected of a predisposition to substance dependence. Patients in our field of work with respiratory depression, clouded consciousness and myosis must be applied with a detailed bodily examination and when injection marks are determined, opioid and opioid derivatives intoxication must be suspected.

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