



Subconscious Management Problems in the Critical Care Medicine



Z. KHELADZE, G. BEKAIA,
T.KURTSIKIDZE, M.DVALIDDZE
(TBILISI, GEORGIA, BRUSSELS,
BELGIUM)



The aim of the first part of the research was to find out Midazolam's effect on rats' movement activity and behavior. Research was performed on white, male 250- 300 gr. rats. In the Clinical part of the research 12 patients were observed with an attempt to influence over their sub-consciousness. We can conclude that for the critical situations Midazolam is an effective and desired sedative agent, with an excellent property of subconscious management. This does not exclude usage of other agents with this purpose.

Key words: Midazolam,, Critical care , subconscious management





Actuality: sub consciousness is the part of human psychics, which has ability to invade in consciousness. Sub consciousness is the mode of life which occurs below the level of our conscious awareness, it is the passive knowledge written in the human memory and controls the functions of organism. Sub consciousness is managed by the ventromedial region of frontal cortex and is structured into will, desire, mind and feeling/emotion.

The sub consciousness is the dominion of all the frame of reference which is beyond conscious organization. Its' first function is to contend with conditions of stress and to structure subjective tension reducing responses to all vital circumstances. Here are seated all the primary human instincts, which act upon and are themselves acted upon by the sum total of those experiences which, directly or indirectly, have a bearing of the security and the continued survival of the individual. Sub-consciousness in the system of mind includes the sum total of psychodynamic manifestations related to all the pre-genital stages in the development of the individual up to the point it even includes subconscious material from the genital period. All the subconscious references are born of the wide range of stress experiences building on the intensity of the stress, responses and the counter responses to them.



Sub-consciousness in the system of body- The arrangement of sub-consciousness in the system of body, manifests itself particularly in the form of those unlearned programs as the instincts, these are singular, accomplishments of primeval highly acute and universal sensitivities to the condition of existence, inter woven with the organisms natural biological and physical recourses. The intensivity of these sensitivities and the caliber of bio and physical elements will determine the exact behavior of the instincts their reactions or responses to stress.

Is it important for critical medicine to influence over sub consciousness to regulate such feelings as fear, pain and etc. in the dangerous states of human life? It should be emphasized that this question is first stated in this work and here is the first attempt to answer it.



In critical care medicine there are lots of accidents when conscious patient feels, that his (her) life is under danger. Patient is monitoring how his treatment is going on, and feels emotionally depressed and uncomfortable. The best way to overcome such problem is subconscious management, which depends on the received drug and its doses.



It is important to achieve the degree when patient feels comfortable and free of fear and pain. In order to fulfill above mentioned requirements, the Midazolam could be considered as the safe and effective sedative agent.

The Midazolam receptors cause an increase in the susceptibility of the cell to the inhibitory neurotransmitter γ -amino-butyric acid (GABA). The stimulation of these receptors is responsible for the sedative and anticonvulsant properties of the Midazolam. The Midazolam and the GABA receptors are coupled to a chloride ion channel. Flow of chloride ions through this channel from the extracellular fluid to the intracellular causes the charge within the cell to become more negative, making the cell refractory to stimulation. It can be easily regulated, is safe and is quickly excreted from the body.



The aim of the first part of the research was to find out Midazolams effect on rats movement activity and behavior. Research was performed on white, male 250- 300 gr. rats.

Movement activity and sedative effects had been estimated by scale proposed by Sh. Shymoiana (1999)- Table N1

Point	Activity
0	normal
1	mild ataxia
2	ataxia
3	disappearing of postural reflex (severe ataxy)
4	immobilization (reacts on pain)
5	no reaction on pain (anesthesia)



In the first part of experiment there were 4 groups (6 in each) of 24 rats. Midazolam was given to the rats in the doses of 0.6; 1.2; 2,5; 5mg/kg (dispersed in 0.5 ml normal saline, dropped on the solid food). 15 minutes after receiving the medication the rat was placed in the camera and was under observation for 60-120 minutes.

The emotional behavior of rats was studied by the method of "passive moving away" That is based on rats' inclination to move away from the light. Experimental camera consists of two sections: 1. lighted section (big one) and 2. Dark section (smaller one), which are connected to each other by 5 to 6 cm hall. The rat which is placed in the lighted section quickly moves to the dark, where he receives electrical impulses from the metal floor. This is the way, the emotional reaction of fear forms. Rat immediately returns to the lighted room and remains there. The reaction is checked in 20 min, 2, 4 and 24 hours. If rat doesn't go to a dark room he still feels fear.



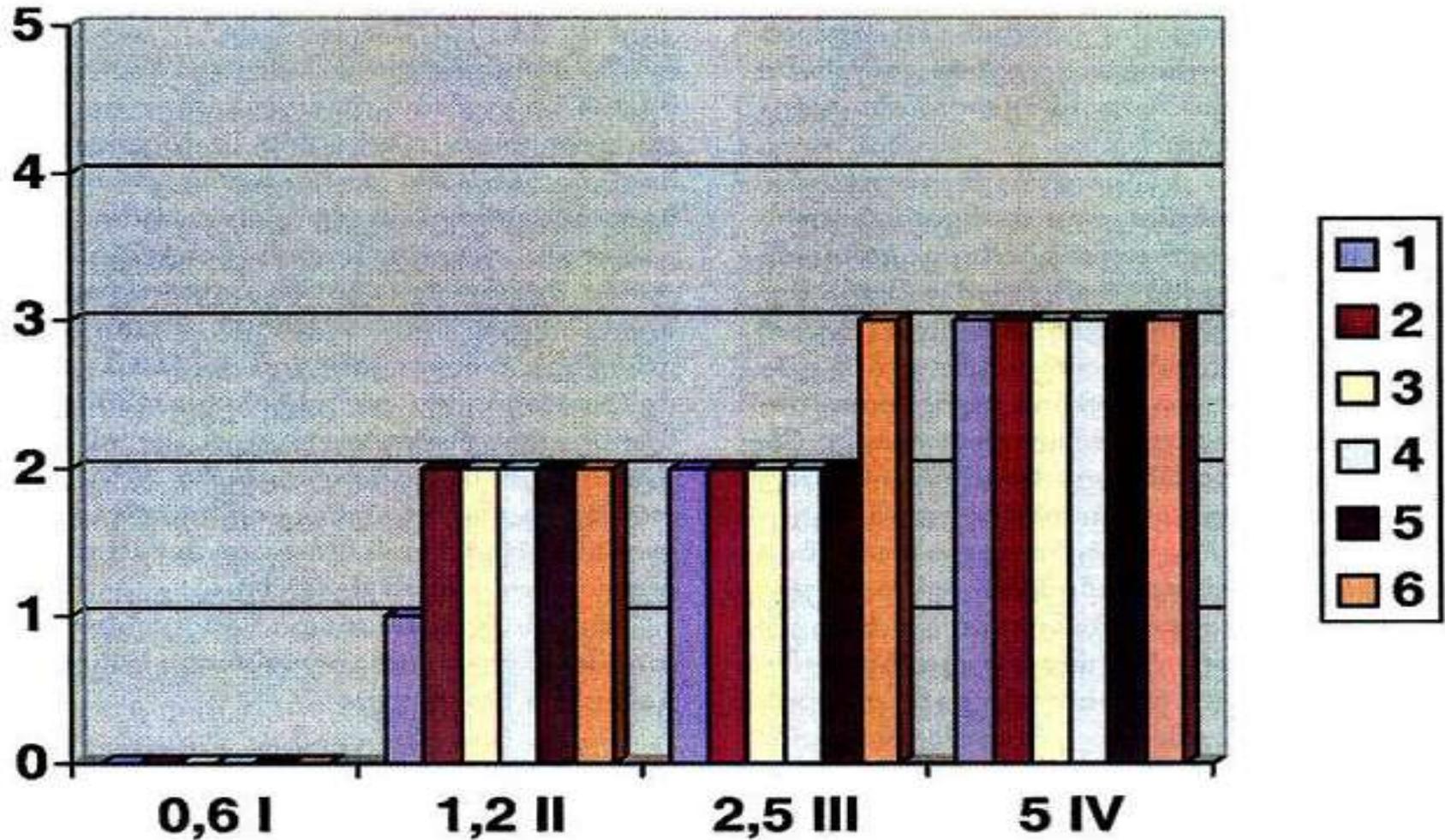


The aim of the second part of experimental research was to determine the effect of Midazolam on the brain blood circulation. Midazolam was given to the rats in the doses of 0.6; 1.2; 2.5 and 5mg/kg. The experiment was performed by penetrating measuring electrode in the cortex of the rats' brain and electrode for comparison under the skin at the scalp.

Blood flow level was measured:

1. before receiving Midazolam (three control measurement with 10 minute intervals)
 2. after 20 min, 2, 4 and 24 hours of receiving Midazolam.
(Table 2)
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Table 2
Changes in animal behavior



REMARK: EACH COLOR CORRESPONDS TO EACH ANIMAL

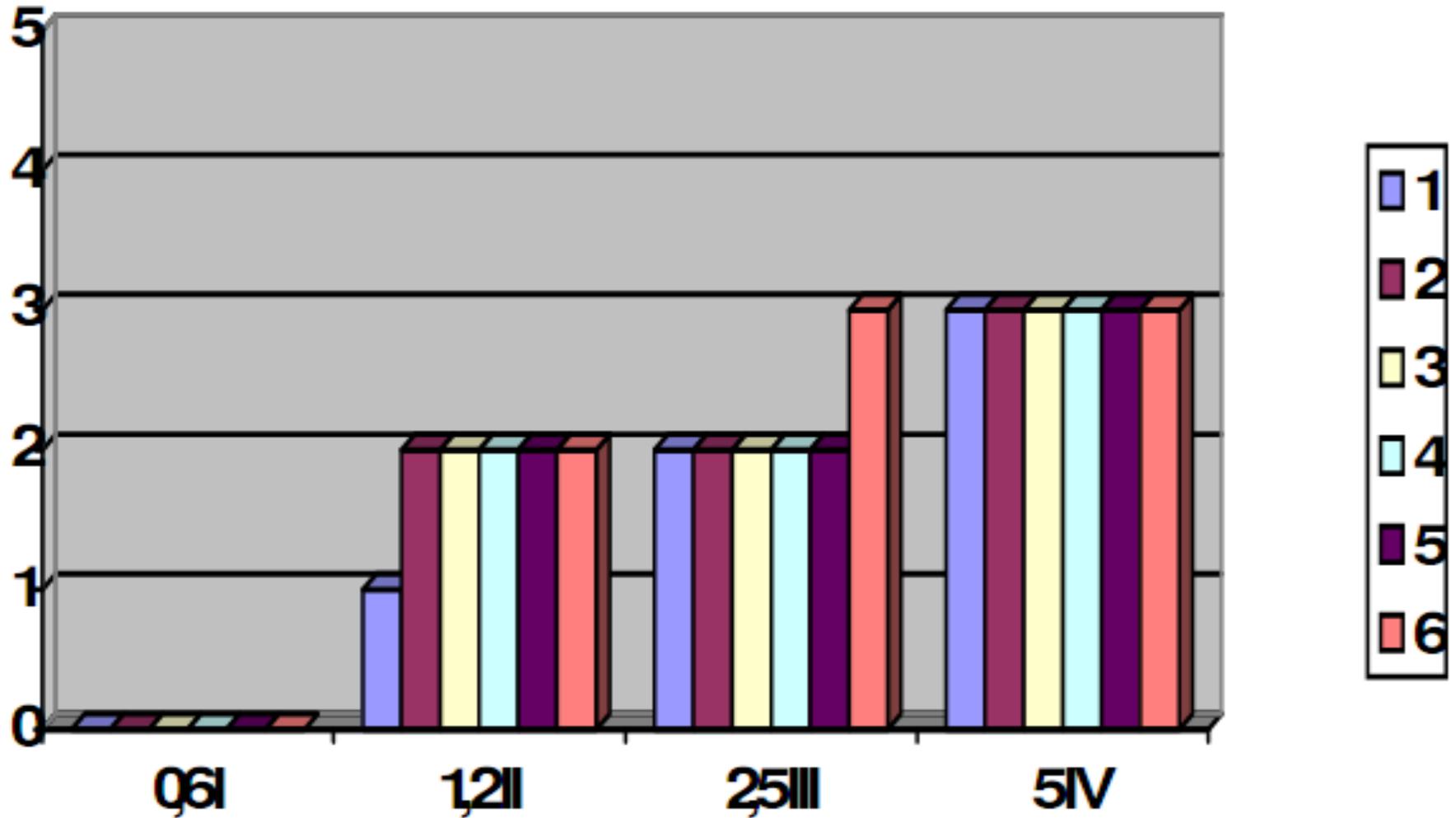
The systemic blood pressure was measured with apparatus, which was placed on the tail of the animal, which was continuously warmed up to 37°C, the measurement of systolic and diastolic blood pressure was performed with oscillograph, and then median pressure was calculated.

Local blood circulation in the cortex of the brain was studied by the method of "Molecular Peroxide by Clarence". In the Clinical part of the research 12 patients were observed with an attempt to influence over their sub-consciousness. Critical condition in above patients was caused by multiple trauma, severe cerebral traumas, insults, sepsis, intoxication etc. Midazolam was administered in doses of 0.2-0.3 mg/kg/hr, intravenously during 3-12 days.

Results and discussion:

In the first part of the experiment, it was found out that small doses of Midazolam (0.6mg/kg) don't cause any sedative effect on the rats. Use of Midazolam in the 1.2mg/kg doses in 5 cases from group 2 (84,4%) caused mild ataxia (1) point after 30 minutes of administration. With third dosage (group-3) 5 animals had ataxia on the 30 minute (2 points) 5mg/kg dosage caused severe ataxia with loss of postural reflex in all cases (3 points). 30-60 minutes after administration of medication it was estimated 2-3 points, for 90 minutes the level of ataxia was decreased until 1 point. (Table 3)

Table 3
Changes in animal behavior



REMARK: EACH COLOR CORRESPONDS TO EACH ANIMAL



Although there were changes of behavior, movement disorders were minimal. They moved throughout the camera freely, although some kind of slow motion was observed in the animals of group 4.

Rats from the first group after receiving Midazolam were placed in the lighted section and test of “passive moving away” was done. In 20 minutes they moved into the dark section, but 24 hours after the test only one out of 12 entered the dark section, so

conclusion is, that in the first place it was anxiety reduction, but feeling of fear stayed into the mind and after Midazolam completely cleared off, the CNS structures, responsible on emotional reaction of the fear returned in the previous stage.





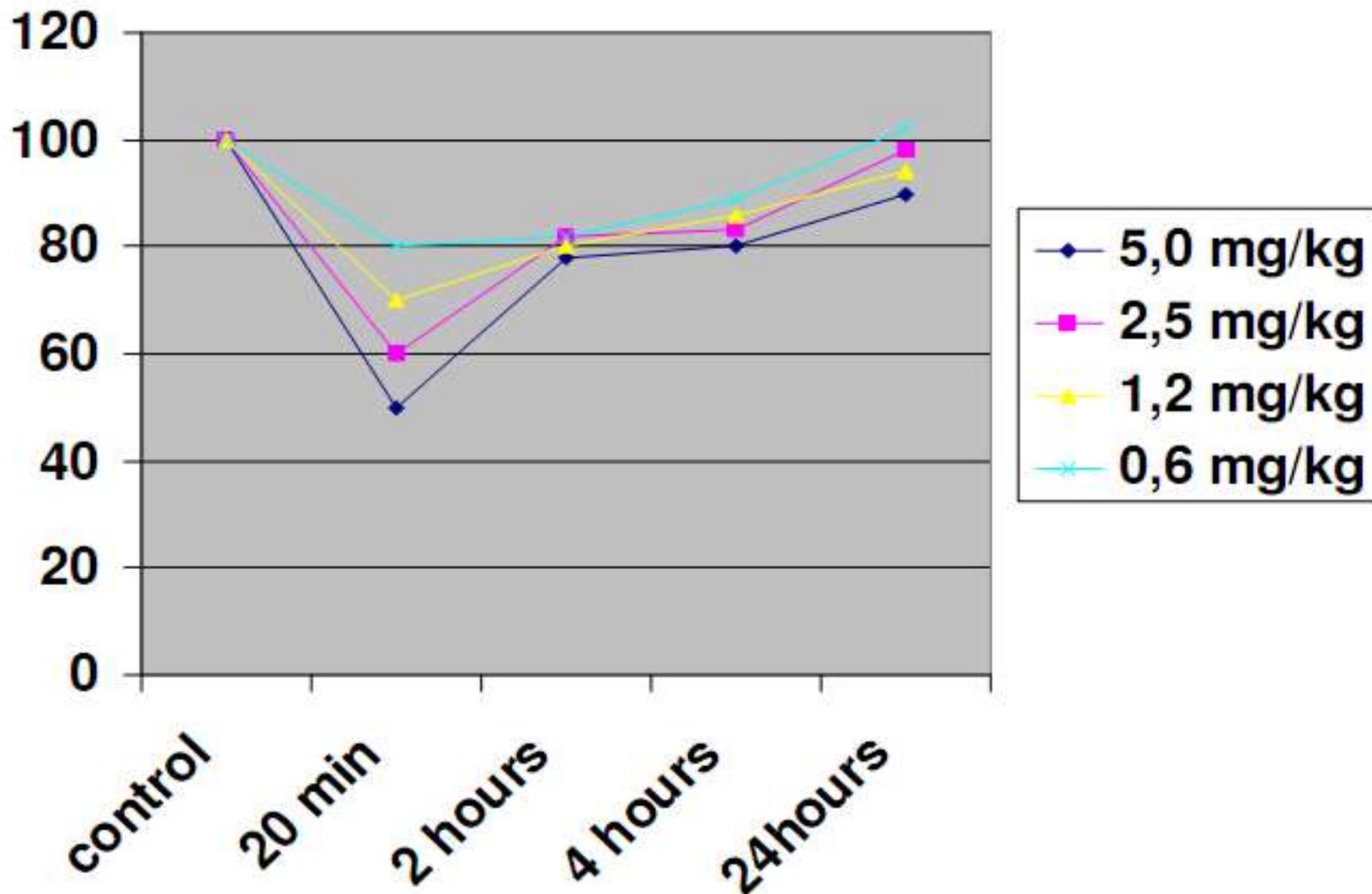
Rats from the second group (receiving Midazolam in doses of 5mg/kg) were also placed in the dark section and received painful electrical frustration. Afterwards only 3 out of 12 returned into the lighted section and 9 remained in the dark section during 20min, 2, 4 and 24 hours. So, Midazolam reduced not only anxiety level, but also depressed pain receptors activity.

The second part of the experiment showed, that blood flow changes depends on the doses of Midazolam: minimal dose (0.6mg/kg) -minimal changes; maximum dose (5mg/kg) maximal changes, but in every case blood flow reduction took place, maximum reduction-in 20 min, partial recovery -in 2 hours and whole recovery in 24 hours time. (Table 4). During this time arterial blood pressure remained unchanged.



Table 4

Changes in the blood flow after administration of different dosages of Midazolam





From the experimental studies we can suspect that Midazolam affects behavior and reduce blood flow level of the brain at the same time, what makes subconsciousness and all the unwanted feeling associated with it and possible to be managed. Suggested doses of Midazolam are: 0,2-0,3 mg/kg/h (for adult patients), 0,2-0,1 mg/kg/h (for elderly patients) and 0,5-0,1 mg/kg/h (for child patients).

In the patients who had no signs of cerebral coma, permanent infusion of the above dose, induced anxiety level reduction and optimistic feelings. Patients became indifferent to own state, didn't feel any discomfort, were conscious, adequate. No complications or unwanted side effects took place. In patients whose critical state was associated with cerebral coma (3-8 points), no worsening of level of coma was observed.



We can conclude that for the critical situations Midazolam is an effective and desired sedative agent, with an excellent property of subconscious management. This does not exclude usage of other agents with this purpose.

ქვეცნობიერის მართვის პრობლემები კრიტიკულ მედიცინაში
ზ. ხელაძე, გ. ბაქია, თ. ქურციკიძე, მ. დვალიძე
(თბილისი, საქართველო, ბრიუსელი, ბელგია)

თემაში განხილულია კრიტიკული მდგომარეობის დროს ქვეცნობიერის მართვა მიდაზოლამის გამოყენებით, კვლევები ჩატარებულია ექსპერიმენტულ ცხოველებზე (უჯიშო, მამრობით, თეთრ 250-300გრ მასის ვირთაგვებზე) და ასევე კვლევის კლინიკური ნაწილი მოიცავს კრიტიკულ მდგომარეობაში მყოფი ზრდასრული ასაკის 12 ავადმყოფის ქვეცნობიერის მართვის მცდელობას. მიღებული შედეგები მიუთითებს ქვეცნობიერების მართვის პერსპექტიულობას კრიტიკულ მდგომარეობათა დროს და ამ მართვის განხორციელების შესაძლებლობას მიდაზოლამის მეშვეობით, თუმცა არ არის გამორიცხული ამ მიზნით სხვა საშუალებების გამოყენების შესაძლებლობაც.