

## Cellular and Molecular Medicine: Its Role in Perioperative Management of Anesthetic Complications

In this issue of the Journal, two manuscripts are published that are involved with two main perioperative anesthesia challenges:

- Perioperative bleeding
- Perioperative pain management

Perioperative pain management has been a historical challenge for all the patients (1). As a matter of fact, a number of different aspects are involved in this issue. First of all, the role of pain and its impact on homeostatic functions of the human body has been studied very well; the positive effects of pain control as well. However, there is still a paucity of available clinical pain killers and the current methods, though somewhat effective, lack full satisfaction both for clinicians and the patients (2-6). In this volume of the Journal, Talebi et al have discussed Molecular Mechanisms and Future Perspectives in Perioperative Pain Management (7).

Their approach to pain management involves a number of well-defined molecular mechanisms but their proposed potential analgesic compounds are really novel and consider a whole perioperative viewpoint. This could be a new window for management of perioperative pain based on using novel methods for finding appropriate drugs with fewer clinical complications. Starting with routine analgesic agents, they shift to novel pharmaceuticals currently under research:

- Modulators of neuronal activity
- Agents blocking receptor proteins such as NMDA and AMPA receptors
- Probiotics
- Magnesium
- Pulsed electromagnetic fields which improve calmodulin-dependent nitric oxide and/or cyclic guanosine monophosphate signaling
- TRPV-1 (transient receptor potential vanilloid-1) agonist
- glutamate receptor antagonists; like N-methyl

D-aspartate (NMDA) receptor antagonists or other drugs such as MK- 801 (i.e. dizocilpine), AP5, and traxoprodil

- GABA-ergic agents
- immune modulation with glial modulators
- immune modulation with anti-cytokines agents
- antidepressants
- Cannabinoids acting through CB1 and CB2 receptors
- omega-3 polyunsaturated fatty acids-derived lipid mediators such as resolvins
- Calcitonin
- Vitamin C

In another review published in this issue of the journal, Dorgalaleh et al have discussed "Burden of Congenital Factor XIII Deficiency in Iran" (8). Considering this review with other related researches from this author and colleagues leads us to a very definite approach in perioperative management of coagulation factors; a phenomenon which could be a lethal challenge if managed inappropriately by anesthesiologists. In the current era of cellular and molecular anesthesia, the traditional practice of bleeding management is not sufficient and there is a clear and definite need for refreshing and updating data on this field. This research team has published a number of well conducted researches related to cellular and molecular aspects of perioperative bleeding management and this trend could lead us to novel approaches in finding novel cellular and molecular solutions for a major perioperative challenge for anesthesiologists (9, 10).

Cellular and molecular medicine is expanding its clinical role from day to day. Personalized medicine seems the appropriate response for many unresolved problem and this is why we could rely on this approach more than before. Integrating the

techniques of cellular and molecular medicine to our daily anesthesia practice improves not only the quality of care; but also, opens new windows for overcoming challenges that were previously considered as inaccessible fields.

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