BERITA ANESTESIOLOGI

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Newsletter of the Malaysian Society of Anaesthesiologists and the College of Anaesthesiologists, Academy of Medicine of Malaysia

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Message from the President

The future of anesthesia

In my twenty years of anaesthetic practice, I have witnessed how anaesthesia had undergone changes, not only in techniques of administration but also in assuming more important roles in patient care. It is a challenge to predict the evolvement of anaesthesia in the next twenty years and our response to this evolution. In a plenary lecture by Professor Ronald Miller on 'the future of anaesthesia' during the recent 12th AACA in Singapore, he stressed on the important role of anaesthetists as managers of the 'Peri-operative Service'. Our role will be to provide an integrated care for surgical patients from preoperative assessment at the clinic, to postoperative pain management. Apparently more anesthesiologists in the US are currently assuming these positions. He predicted that there will be an exponential rise in the adoption of information technology, with more hospitals turning 'paperless',and automatic capture of anaesthesia data being the norm. He was rather surprised at the rapid rate of acceptance of robotic surgery and could not discount the possibility of multiple anaesthetics being administered from a single location, much the same way tele-surgery is being conducted! To meet these future challenges, training of anaesthesia must be constantly reviewed to reflect the changing trends. Finally, Professor Miller predicted that with their expanding roles in the fields of resuscitation, intensive care, anaesthesia and pain management, anaesthetists in the year 2020 will be the most sought after clinicians in the hospital.

National Specialist Register

Back home, members are understandably anxious about the newly introduced National Specialist Register. I strongly recommend members to visit the website at www.nsr.org.my to obtain more information on this matter. We understand that the government will revise the Medical Act as early as next year. It will then be compulsory for all clinicians who wish to practice as specialists to register themselves, with the Academy of Medicine being given the task to maintain the Register. The registration fee is RM 1000 for Academy members and specialists in the public sector and RM 1500 for non-Academy members and practitioners in the private sector. Currently, registration is valid for a five-year period. Clinicians will also be required to produce references from referees, although this requirement is now waived for clinicians who are currently practicing as specialists, provided all necessary supporting documents are in order.

One area of contention is the list of recognised specialties in the Register. Each specialty is guided by its Specialty Board or Credentialing Committee. Committee members must not serve as individuals but spokesmen of the professional bodies for which they were elected to represent. For the discipline of anaesthesia, the policies set by the Anaesthesia Credentialing Committee reflect the views of the majority of anaesthetists in the country. Decisions made at the Credentialing Committee have far reaching implications and must not deviate from consensus reached at the annual general meeting.

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The subspecialty or special interest groups have dissenting views and are advocating a different approach. It is important that anaesthetists in Malaysia opt for a well-charted course. It makes good sense for us to adopt the models used in the more developed countries such as US, UK, Australia or even our neighbour, Singapore. In matters that affect the practice of many generations to come, there is no room for experiments or mistakes. I call on all members to follow this matter closely to ensure that we are on the right tract. Some disciplines are already severely divided and fragmented, let us not make the same mistake.

MSA Continuous Professional Development Activities

Since taking over the presidency, I have tried to promote continuing medical education as the cornerstone of professional development. Besides the yearly national conference on intensive care (NCIC), which is now in its fifth year, we have upgraded the annual scientific meeting to the status of a national conference. Members who have attended these conferences will agree with me that our scientific meetings are of high standards and provide value for money updates on wide ranging topics. In the Klang Valley, the Saturday mini-symposia have been introduced and anaesthetic departments in the universities (UMMC and UKM) and national referral centres (HKL and IJN) rotate to organize such CME sessions. So far, we have had four sessions and I am encouraged by the increasing number of attendees at these meetings. I do hope this will be a success and such activity can be organized along the same model in other regions such as Penang and Johor Bahru.

CPR training

In 1986, the Society through the (then) Critical Care Medicine Section (CCMS) introduced the Basic and Advanced Cardiac Life Support training programme in Malaysia. Since then, CPR training programme has taken root in Malaysia and is formalised in many government hospitals. In some states, CPR training is also extended to the public. Unfortunately, while we may take credit for being the professional body that introduced CPR training to this country, MSA has not played an active role subsequently. This is a shame since anaesthetists currently make up the largest number of providers in CPR training programme especially in advanced life support courses.

Now, twenty years later, the Executive Committee has decided that MSA must resume its role in CPR training. A CPR training committee was formed and this committee will embark on an active training programme for health care providers both in the government and private sectors. We hope by pooling our resources and working closely with the government hospitals, MSA will provide the leadership and direction in CPR training and help to promote and improve the standards of cardiopulmonary resuscitation in Malaysia.

Intensive Care

The Intensive Care Section is to be commended for having successfully organized the 4th national conference which was attended by more than a thousand delegates. The NCIC is now a major local event for many healthcare providers and it receives strong support from the medical trade industry. But what is also apparent in the recent conference is that more than half of the delegates were doctors, with a significant number of them working in non-anaesthetic disciplines e.g. medicine and surgery. This may signal the beginning of a new development in Malaysia which will see intensive care evolving into a specialty with multi-disciplinary input. It behooves us to take note of this development and consolidate our position as leaders in this field.

I am proud that the Intensive Care Section has once again produced a clinical guidebook on antimicrobial therapy in adult ICUs which is of high standards. The guide is tailored to local needs and I believe members will find it useful in their day-to-day practice. To complement this effort, a group of intensivists from Ministry of Health have produced a series of management protocols on a wide range of topics from sedation to weaning from mechanical ventilation. These protocols are based on current best practice and are particularly suitable for junior specialists managing patients in the ICU. Both documents may be downloaded from the MSA website.

Finally, with the year coming to an end and 2007 just round the corner, I take this opportunity to wish you a Happy New Year!

Ng S H
President

4th Regional Anaesthesia Workshop

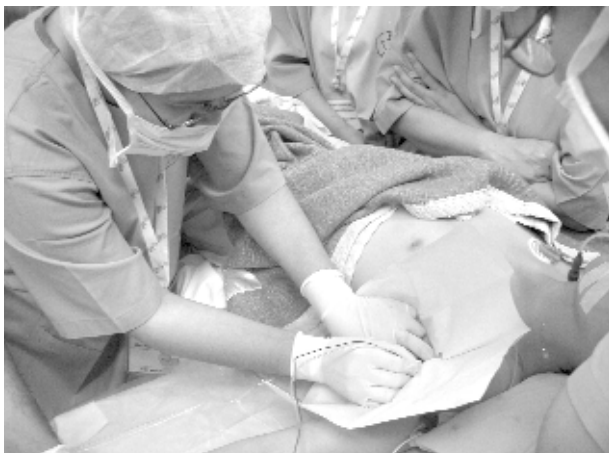
Report by
Dr Shahridan Mohd Fathil & Dr Nordin Yunus
Department of Anaesthesiology, Universiti Kebangsaan Malaysia

Held for the fourth consecutive year, Hospital Universiti Kebangsaan Malaysia's (HUKM) Regional Anaesthesia Workshop proved to remain a popular Continuing Medical Education (CME) programme for Anaesthesiology trainees. This intensive programme which incorporated lectures and hands-on workshop utilizing both cadavers for anatomy demonstrations as well as patients in the Operating Theatre provided a valuable learning experience for the participants.

The workshop was held from the 16 to 18 August 2006 at HUKM, Cheras and Kuala Lumpur Campus, UKM. It was jointly organized by the Department of Anaesthesiology and Intensive Care, Faculty of Medicine, UKM & Aesculap Academy Malaysia.

The faculty consisted of Dr Nordin Yunus, Dr Muraly Somasundram, Dr Shahridan Mohd Fathil, Dr Loy Yuong Siang, Dr Muhammad Maaya and Dr Sumiati Mohd Daud.

There were 25 participants in total, of which 12 were trainees from HUKM. The remaining participants were from various government hospitals including 2 specialists.



DAY ONE ★ 16 AUGUST 2006

A/Prof (Clinical) Dr Hj Jaafar Md Zain (Head of Department of Anaesthesiology and Intensive Care) gave the welcoming address, while Prof Dato' Dr Lokman Saim (Dean of Faculty of Medicine, Universiti Kebangsaan Malaysia) officiated the workshop.

The didactic sessions included lectures on

1. Upper Limb Plexus Block – Surface Anatomy & Technique
2. Lower Limb Blocks – Basic Techniques & Surface Markings
3. Peripheral Nerve Stimulator

Ms Cheah May Choo of B Braun Medical Supplies Sdn Bhd also gave a short presentation on different equipment available for peripheral nerve block.

During the cadaveric dissection at the Department of Anatomy, Kuala Lumpur Campus, UKM, participants were shown the anatomy of various plexuses and peripheral nerves. The significance of various landmarks for different nerve blocks was also demonstrated by the faculty.

DAY 2 & 3 ★ 17 – 18 AUGUST 2006

Participants were shown various regional block techniques and approaches during the OT sessions on the second and third day of the workshop. Some participants performed the blocks under supervision of the faculty.

In between cases, the participants and members of the faculty held discussions regarding the various techniques and the use of different needles, catheters and drugs in achieving effective regional anaesthesia. The participants also had the chance to practise nerve mapping using peripheral nerve stimulators. A video tutorial on "Peripheral Regional Anaesthesia" reinforced the skills learnt.

The overall rating for the workshop was very positive and feedback from participants showed that the workshop had met their expectations. The participants were also very appreciative of the dedication shown by faculty members in teaching and guiding them.

K Inbasegaran
RESEARCH FUND

The K Inbasegaran Research Fund is for the purpose of supporting one or more research projects in the study of anaesthesia, intensive care, pain medicine and related sciences and branches of medicine. It is valued up to RM10,000 per year.

The Research Committee of the MSA shall administer this Fund.

1. Eligibility

1.1 The purpose of the grant is to wholly or partially fund research by Members of MSA who are in good standing.

1.2 Funding is available for research conducted wholly in Malaysia.

1.3 The Principal Investigator must be a member of MSA and at least one of the investigators must be an Ordinary Member of MSA.

2. Application Process

2.1 An individual may only be named as Principal Investigator on a maximum of one (1) application in any one year.

2.2 Applications must be made on the prescribed forms and must adhere to the application guidelines.

2.3 The forms will be made available on the MSA website.

2.4 The closing date for applications each year will be 31 December. No late submissions will be accepted.

2.5 The applicant must submit ALL the material requested by the Committee by the deadline (i.e. four hard copies and one soft copy). If all the material requested is not submitted by the deadline, the application will be rejected.

2.6 The Committee may reject applications that do not comply with the Application Guidelines (e.g. with respect to eligibility, or completeness or correctness of the application form). These applications will not be reviewed.

2.7 Applications for supplementary funding for existing project grants will not be accepted. The applicants must make a new, full project grant application in which progress with the project and the reasons for the need for supplementary funding are fully disclosed. The application will compete in open competition with the other applicants.

2.8 The application process is confidential. Information will not be released other than in compliance with any waiver or consent given by the applicant.

3. Conditions of MSA Research Fund

3.1 All payments will be awarded and made in Malaysian Ringgit. Progressive payments will be made in accordance to invoices and statements.

3.2 The decision made by the MSA Executive Committee shall be final.

3.3 The applicant must abide by these rules and regulations. The MSA Research Fund Committee must be informed if there is a change in the principal investigator.

3.4 Reporting obligations are as follows:

3.4.1 A progress report must be made on the prescribed form and be submitted every three months while the project is ongoing and a final report submitted when the project is completed.

3.4.2 Reports will be considered and approved by the Chairman. If necessary, the Chairman may ask other members of the Committee, the full Committee or EXCO of MSA to consider reports.

3.4.3 The Society requires that its contribution to be acknowledged in all publications and presentations of the research project. Reprints of all publications should be sent to the Society.

3.5 The Society requires that a presentation relating to the project be made at a major Society or College meeting in Malaysia or meetings affiliated to MSA such as ASEAN, WCA or AACA.

3.6 An award will also be terminated if the principal investigator leaves the institution or study research before the expiry of the award, unless other arrarangements satisfactory to Society are made.

3.7 Applicants must declare any other support that is received from the time the application is made until completion of the project.

CONTACT INFORMATION

Research Committee

Chairman	Professor Dato' Wang Chew Yin
Committee Members	Associate Professor Jaafar Md Zain
	Professor Nik Abdullah Nik Mohd
	Dr Lim Wee Leong
	Dr Ng Siew Hian

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Pharmacology *Multiple Choices Questions*

In this and the next few issues of the Berita, we have included a series of pharmacological MCQs for primary candidates. The answers are displayed at the last page.

To Dr T C Lim from Hospital Melaka: Thank you for contributing the questions!

To those trying out the questions: Have fun and no peeking!

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1. Regarding thiopentone

A. It is mainly metabolized via desulfuration to inactive thiopentone carboxylic acid and hydroxythiopentone
B. Approximately 3% of a dose is metabolized to phenobarbitone which causes prolonged action
C. Thiopentone may cause low incidence of minor excitatory movements
D. Cerebral perfusion pressure is usually reduced with thiopentone as a result of a drop in mean arterial pressure
E. At time of awakening, approximately 50% of thiopentone has undergone metabolism forming inactive metabolites

2. Regarding thiopentone

A. The process of tautomerization of thiopentone is pH-dependent
B. It is contraindicated in prophyria due to induction of β-aminolevulinic acid synthetase
C. Thiopentone administration is associated with 350% rise in histamine and the histamine level usually normalizes within 60 seconds
D. Consequences of extravasation are mostly due to alkalinity of solution
E. Precipitation of thiopentone crystals in arteries is due to its low solubility of 0.03% at pH of 7.4

3. Regarding midazolam

A. Commercial preaparation of midazolam is buffered to achieve pH of approximately 5.5 – 6.9
B. The pH dependent ring opening phenomenon is a classical example of dynamic isomerism
C. It has slow effect-site equilibrium time of about 1 – 6 minutes
D. The bioavailability after an oral dose is high at about 90%
E. Approximately 90% of a dose is metabolized to 4-hydroxymidazolam

4. Regarding midazolam

A. It is a centrally acting muscle relaxant
B. Patients may have paradoxical excitement following its administration
C. It is a good drug in cerebral resuscitation as the dose required to produce burst suppression is much lower as compared to propofol
D. The onset of midazolam is about the same as that of thiopentone when used as an induction agent
E. The amnesic effect is mainly related to the sedation produced by interaction between midazolam and its specific receptors

5. Regarding propofol

A. It is available as 2% emulsion formulation
B. Propofol emulsion has the lipid load of 2 kcal/ml
C. Long- and medium-chain triglycerides are incorporated into propofol emulsion
D. Propofol may be available as a prodrug in form of propofol phosphate
E. It can be diluted in dextrose 5% solution to produce a 0.02% solution for infusion

Congratulations

The Malaysian Society of Anaesthesiologists would like to congratulate the following candidates (names in alphabetical order) for passing the recent examinations. Well done folks!

PART I

Abdul Jalil bin Ahmad
Albert Navin Durairatnam
Andrew Ng Wei Aun
Anizah bt Bin Yamin
Chong Woon Shin
Esa bin Kamaruzaman
Faiz Azraai bin Abdul Aziz
Fatmawati bt Noseri @ Nazri
Gan Lian Aik
Jeyaganesh a/l S Veerakumaran
Kamal Bashar bin Abu Bakar
Kok Meng Sum
Low Shiau Chuan
Marina bt Ahmad
Mohd Ashri bin Ahmad
Muzlifah bt Kamarul Bahrin
Nazarinna bt Muhamad
Ooi Shien Lung
Puhalanthy a/l Pandian
Ray Joshua Ryan a/l Joseph S Ryan
Sanah bt Mohtar
Salimi bin Mohd Salleh
Siti Salmah bt Ghazali
Siti Yurnizar bt Mohd Yusoff
Sivanesan a/l T Subramaniam
Suzana bt Abdul Malik
Tang Mee Yee
Tie Hieng Kai

PART II

Almki S A Aldufani
Farizawati bt Muhamad Arip
Loh Pui San
Noraini bt Sangit
Nurhayati bt Mohd Idris
Rosliza bt Samsudin
Rosmawati bt Danial
Sharedah bt Adnan
Zainisda bt Zainuddin

4th National Conference on Intensive Care

15 – 17 September 2006
Sunway Pyramid Convention Centre

Report by *Dr Nor'Azim Mohd Yunos, Hon Secretary, Intensive Care Section, MSA*

It was another successful National Conference on Intensive Care (NCIC). The 4th NCIC, held at the Sunway Pyramid Convention Centre from 15 to 17 September 2006, saw a record attendance of 1070 delegates and 73 trade exhibitors. Most importantly, feedback from delegates indicated that the scientific contents were of high quality.

Several changes were introduced by the organising committee this year. In an effort to improve NCIC educational value, the number of pre-conference workshops were increased to three. These workshops; on intensive care clinical nutrition, bronchoscopy in ICU and continuous extracorporeal blood purification (CEBP) in ICU, were well attended with majority of participants expressing great satisfaction. Many suggested that the trend of having various workshops for different categories of delegates be continued for future NCICs.

The committee also opted for a short and simple official opening. Nonetheless, the opening ceremony was made memorable by a video presentation of interviews with former ICU patients and their relatives. Listening to their stories, many of us were left reflecting on our role as intensive care providers.

The subsequent plenaries and symposia provided excellent updates on recent advances in Intensive Care Medicine. The wide ranging topics were thoroughly analysed and elaborated by the faculty of speakers, international and local alike. For the benefit of the delegates, more lectures were compiled in full text in the abstract book this year. Befitting the committee wish for NCIC to be 'the meeting of minds' for local ICU clinicians and nurses, the conference also saw a lot of informal discussions between the audience and the speakers on various ICU topics of interest.

It was heartening to see an overall higher quality of free papers and posters submitted this year. Dr Zanariah Yahaya, from Hospital Sultanah Aminah Johor Bahru, won the NCIC Award for Free Papers section with her paper 'Central Venos Catheter-related Blood Stream Infections: An Analysis of Incidence and Risk Factors'. The Best Poster award, on the other hand, went to Dr T C Lim from Hospital Melaka for his poster on 'Incidence of Ventilator Associated Pneumonia in Patients Using Open Tracheal Suction System (OTSS) and Closed Tracheal Suction System (CTSS): A Prospective Study in Hospital Melaka. Congratulations to both Dr Zanariah and Dr Lim!

The continuing success of NCIC augurs well for the development of intensive care medicine in Malaysia. Let's hope the 5th NCIC 2007 will continue this tradition.

Intensive Care Section, MSA Financial Support for Attendance at Intensive Care Conferences Overseas

I. CRITERIA

A. Must be a member of the Intensive Care Section (ICS), Malaysian Society of Anaesthesiologists (MSA) in good standing for at least three years. This means that for the past 3 consecutive years, the member must have paid his/her subscription within the year it is due.

B. Must be:
1) presenting a free paper(s), or
2) representing the ICS
3) an invited speaker of any of the conferences listed in C.

C. Must be attending one of the following meetings outside Malaysia:
1) Asia Pacific Associations of Critical Care Medicine (APACCM) Conference
2) International Symposium on Intensive Care and Emergency Medicine (Brussels)
3) World Congress of Intensive and Critical Care Medicine
4) SCCM Annual Congress

D. Must apply in advance (2months before the date of the conference) to the ICS Executive Committee for approval before the conference.

E. For free papers, the study must not have been presented, in part or as a whole, at any local or overseas conference before.

F. Must not have received financial subsidy from other sources for registration and airfare. The ICS reserves the right to request for a refund of its full sponsorship should there be any proof that the applicant has received another sponsorship.

G. Must not have received a financial subsidy for presentation of free papers from the ICS or MSA in the previous year. This means that members are only allowed one subsidy for every two years except when officially representing the ICS or as an invited speaker at the conference as per Para 1 (B) (2) and (3) above.

H. Must not have made any false declarations to the Society previously.

I. Must obtain written agreement of all the co-authors that he/she be allowed to present the paper.

II. FINANCIAL CONSIDERATION

A. The amount of subsidy will depend on the region where the meeting is held. The subsidy will only include conference registration and airfare (economy via the shortest route). At the present point in time, the maximum amounts, are:

Asia Pacific Associations of Critical Care Medicine (APACCM) Conference . . . . RM 3,000

International Symposium on Intensive Care and Emergency Medicine (Brussels) . . . . . RM 5,000

World Congress of Intensive and Critical Care Medicine RM 5,000

Society of Critical Care Annual Congress . . . . . RM 5,000

The amount for subsidy shall not be more than the cost of registration and the airfare.

B. Priority categories will be of the following order:
1) Oral free paper presenters who are applying for the first time
2) Oral free paper presenters who have received ICS sponsorship before
3) Poster presenters

C. Limiting total amount of subsidy per conference (Capping)
The Executive Committee reserves the right to set a limit to the amount of subsidy to be given in order to allow proper budgeting. In order to prevent the capped limit from being exceeded, the Executive Committee reserves the right to decrease number of successful applicants

III. APPROVAL OF FINANCIAL SUPPORT

A. Selection Committee
The selection Committee shall comprise the following:
1. ICS Chairman, who shall chair the committee
2. Two other members of the Section nominated by the Executive Committee, one of whom shall be full time clinician working in intensive care

The Selection Committee shall review the submitted abstracts and make recommendations to the Executive Committee.

B. Selection Process
The applicant shall provide to the Selection Committee a copy of the abstract sent to the organizing committee of the conference, together with the letter of acceptance. The cover letter to the Selection Committee shall then include the following:
a) a declaration that the free paper or poster has not been presented, in part or as a whole, at any local or overseas conference before.
b) a declaration that the applicant has not received financial subsidy from other sources for the items applied for.
c) certification by the Head of Department, Director of Hospital or Director/Chairman of Research in the Institution where the study was carried out
d) a statement agreeing to the decision of the Executive Committee with regard to the application and amount of subsidy granted

IV. DELEGATES APPOINTED BY THE SOCIETY

Delegates appointed by the Society will automatically enjoy the subsidy without need for further application. Such appointments must be recorded in the minutes of the Executive Committee meetings. Currently the appointment refers to Society representatives at APACCM business meetings.

V. DECISION AND APPEAL

The Executive Committee will make the decision on whether to grant any subsidy taking into consideration the recommendation of the Selection Committee.

The Hon Secretary will inform applicants of the outcome within a reasonable time interval.

The decision of the Executive Committee is final and no appeal will be entertained.

VI. DISBURSEMENT

The applicant must provide original official receipts of registration and airfare and certificate of attendance to the Executive Committee before the disbursement of subsidy is made.

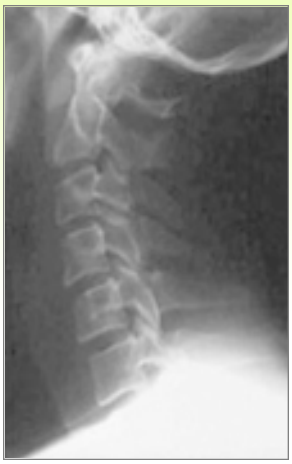
VII. REVIEW

This policy is subject to review from time to time by the Executive Committee and will depend on the prevailing financial position of the Society.

Executive Committee
Intensive Care Section, Malaysian Society of Anaesthesiologists
November 2006

Contest

A 23 year old motorcyclist was brought to the Emergency Department following a road traffic accident. He was found unconscious with grazes on his forehead. A cervical spine X-ray (lateral view) was taken and is shown below:



QUESTIONS:

1. **What is your comment?**
2. **What will you do next?**

This contest is open to all medical officers. Please send your answers to rafidah10@hotmail.com or rafidah.atan@med.monash.edu.my. The most correct answer will receive a copy of the 4th edition of Clinical Anaesthesiology by Morgan, Mikhail and Murray. Good luck!

Note: It's okay to get it wrong… promise I won't tell…

ANSWERS TO THE PREVIOUS CONTEST

What is the rhythm shown? Torsade de pointes or polymorphic ventricular tachycardia.

Name a few possible causes : Hypomagnesaemia, hypokalaemia, congenital causes of prolonged QT interval, many drugs including Class IA, Class IC and Class III antiarrhythmics (Vaughn Williams classification), antihistamines, antibiotics etc.

The editor would like to congratulate Dr Yvette D'Oliveiro from Hospital Pulau Pinang for winning the contest. She now proudly owns of a copy of the 4th edition of Clinical Anaesthesiology by Morgan, Mikhail and Murray.

Well done!!

Laughter, the best pain relief (?)

My husband was just coming out of anesthesia after a series of tests in the hospital, and I was sitting at his bedside.

His eyes fluttered open, and he murmured, "You're beautiful."

Flattered, I continued my vigil while he drifted back to sleep. Later he woke up and said, "You're cute."

"What happened to 'beautiful'?" I asked him.

"The drugs are wearing off," he replied.

PHARMACOLOGY Multiple Choices Questions

Answers

1. **FFTFF**

Thiopentone is mainly metabolized via oxidation of side chain at C5 producing inactive thiopentone carboxylic acid and to some extent hydroxythiopentone. Desulfuration of about 3% of thiopentone produces pentobarbitone which is an active metabolite causing delayed recovery following administration of very large doses of thiopentone. Thiopentone causes low incidence (4%) of minor excitatory movements. Cerebral perfusion pressure is preserved as intracranial pressure reduces to a greater extent relative to drop in mean arterial pressure. At awakening only 18% of injected dose of thiopentone has undergone metabolism. Recovery after a single dose is consistent with redistribution of thiopentone to muscle group.

2. **TFFFF**

Thiopentone is contraindicated in porphyria due to induction of δ-aminolevulinic acid synthetase. Thiopentone administration is associated with 350% rise in histamine and the level reduces to normal range after about 10 minutes. The consequences of extravasation are mostly due to local tissue irritation produced by precipitation of insoluble non-ionized thiopentone acid at pH of extracellular fluid. It is unlikely to be due to alkalinity of solution since the adverse effects are less frequently observed when slightly more alkaline solution of methohexitone 1% was used. Damage due to intraarterial injection may be due to precipitation of thiopentone crystals in arteries which have a maximum solubility of 0.003% or 30 μg/ml pH of 7.4.

3. **FFTFF**

Midazolam solutions are adjusted to pH of 3 – 3.5 to promote water solubility. This pH dependent ring opening is not a classical example of dynamic isomerism as H_2O is lost during the conversion. The bioavailability after oral administration is only about 50%. The principal metabolite is 1-hydroxymidazolam and a smaller amount of midazolam is metabolized to 4-ydroxymidazolam.

4. **TTFFF**

Midazolam is unable to produce burst-suppressive EEG. Thiopentone produces induction 50 – 100% faster than midazolam. Amnesia reflects specific effects on memory and is not secondary to drug-induced drowsiness or sedation.

5. **TTTTF**

Propofol is available commercially as 1 and 2% emulsion formulations under various trade names. The lipid load of propofol preparation is 1 kcal/ml for 1% emulsion and 2 kcal/ml for 2% emulsion. Propofol 1 and 2% in 10% long and medium chain triglycerides are available as Propofol Lipuro® commercially. Water-soluble propofol phosphate prodrug is available as Aquavan® and it is enzymatically converted to propofol, formaldehyde and inorganic phosphate. Propofol should only be diluted with dextrose 5% to a concentration not lower than 2 mg/ml.