

## Conference Report:

# European Society of Emergency Medicine Conference (EuSEM): Hersonissos, Crete, October 2006

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The Fourth Conference of the European Society of Emergency Medicine was held in October 2006 at Hersonissos, a beachside resort about 25 km east of Heraklion in Crete, under the auspices of the Crete University Department of Anaesthesiology. Notable features of the area include Bronze Age ruins (particularly at Knossos; Fig. 1), the proximity of Santorini, and numerous scenic walks, most notably in the Samaria Gorge.



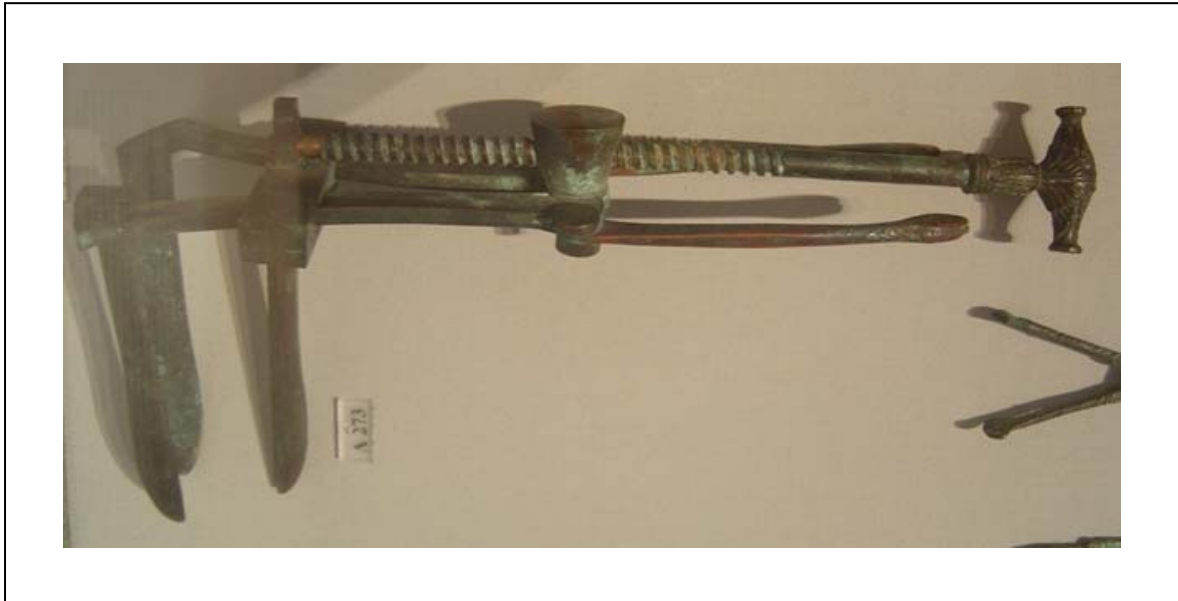
**Fig. 1.** Minoan Palace at Knossos.

As well as being the land of Hippocrates and Aescapulus (Fig. 2), Greece has played an important part in the history of medicine and development of some of the surgical instruments that we still use today (Fig. 3).

The European Society of Emergency Medicine (EuSEM) brings together the various National Emergency Medicine European Colleges and also has a strong North American presence. The 2006 EuSEM Conference was mainly conducted in English, apart from some formal addresses in Greek. The standard of English was generally high, although a notable exception was a number of spoken and written presentations by Spanish physicians.



**Fig. 2.** Aescapulus – note the staff and serpent (Greek National Museum of Archaeology).



**Fig. 3.** Bronze age vaginal speculum (Greek National Museum of Archaeology).

The Conference was held at the Creta Maris Hotel Conference Centre, and the opening was presided over by the Greek Minister of Health who gave a long speech in Greek to the electorate and followed this with a short address in English. The ceremony ended with a banquet and mass Greek dancing on the edge of the hotel swimming pool.

The Conference itself was preceded by a number of Workshops. The Scientific Programme included 'state of the art' reviews, discussions on recent changes to resuscitation protocols, and poster and oral presentations, but no real areas of controversy were stirred up. Some selected topics of interest are summarised below.

### **Abdominal Pain**

A lecture by a Swiss physician examined the salient points of triage, history, examination and investigation of abdominal pain that were pivotal in determining management.

#### ***Triage***

At the level of P2 and P3 patients, there was value in asking recumbent patients to push their stomachs up. Those with increased pain merited the higher level triage.

Different diagnoses in over- and under-50 year-olds mean they should be considered as separate groups.

### ***Examination***

The presenter felt that it is worth looking at the pattern of abdominal movement with respiration, as less abdominal movement correlates with peritonism.

It was emphasised that morphine does not influence the diagnosis or decision to operate and that in undifferentiated pain, there is no change in signs or the accuracy of the diagnosis. Studies were cited indicating that 0.15 mg/kg is as safe as 0.10 mg/kg, and that morphine should be given by slow intravenous injection.

### ***Investigations***

Between 10% and 60% of proven appendicitis cases have a normal full blood count (FBC) and this test does not change a surgeon's mind following clinical examination.

- C-Reactive protein (CRP) is insensitive where the symptoms are less than 12 hours old
- Lipase at 3x normal is useful, but amylase is not
- Urinary trypsinogen is specific for acute pancreatitis.

### ***Urinalysis***

It should be remembered that that urinalysis can be abnormal in non-urological disease.

### ***Initial Imaging Recommendations***

The indications for a plain abdominal x-ray are perforation, bowel obstruction, and presence of a foreign body. In urolithiasis, a plain supine film can be useful in conjunction with ultrasound.

Ultrasound is useful for providing good images of solid organs, and for presumed gynaecological complaints or cholelithiasis. Computed tomography (CT) is the best imaging mode for appendicitis and diverticulitis.

### **Imaging in Abdominal Trauma**

Another Swiss clinician (Dr B. Marincek, Zurich), a radiologist from an apparently well-equipped facility, reviewed imaging in trauma.

*Focused abdominal scans in trauma* (FAST) were stated to have 63% to 91% sensitivity for intraperitoneal fluid but are very operator-dependent. In Dr Marincek's opinion, the best screening technique was multidetector CT which can do an upper body scan in 15 minutes.

The best sequence was considered to be a scout view of the head and cervical spine, followed by head and neck detail if required, then look at the thorax and start the arterial phase.

The probability of active arterial haemorrhage was stated to be in the following order: spleen > liver > kidney > adrenal > mesentery. Localisation requires a rapid bolus of a contrast medium.

### ***Splenic Injury***

This is the most common abdominal injury (around 40% of cases). With CT, it is important to look for:

- Intrasplenic low density
- Perisplenic fluid; and
- Arterial bleeding (a true emergency).

### ***Liver Injury***

The incidence of this abdominal injury is 15% to 20%. The right liver lobe tends to shear against the spine. There may be periportal tracking of contrast, and oedema may be visible following a shearing force.

### ***Renal Injury***

Renal injury comprises 10% of blunt abdominal trauma, but is more common in children. Patients are more susceptible if there is an anatomical abnormality (e.g. a horseshoe kidney).

### ***Pancreatic injury***

This comprises <2% of intra-abdominal injuries. Mostly it is due to compression against the spine.

### ***Stomach Injury***

Stomach injury is rare but may be more likely if the stomach is full.

### ***Bladder Rupture***

Extraperitoneal bladder rupture is the most common type and is mostly treated conservatively. Intraperitoneal rupture usually occurs at the dome and requires surgical treatment.

## **Medical Emergencies**

A series of short lectures dealt with acute medical problems and reviewed current knowledge and where new trends may be leading us.

### **Pulmonary Embolic Disease in the Emergency Department**

This topic was reviewed by Dr Peter Thompson (Kings College, London, UK).

#### ***Diagnosis***

Clinical features of pulmonary embolism include sudden chest pain, dyspnoea or syncope; the absence of these features has 94% negative predictive value. Tachycardia is less common in younger patients with pulmonary embolism and, even in over 40-year-olds, is absent in 30%.

The most frequent ECG abnormality is sinus tachycardia. Right bundle branch block (RBBB) is less common (S1Q3T3 pattern in 20% of cases). Blood gases, including the A-a gradient, are normal in 38% of cases.

#### ***Evaluation***

Evaluation should include the patient's history, physical examination findings, and a pretest probability assessment.

#### ***Imaging***

A chest x-ray is abnormal in 76% to 90% of cases. Peripheral oligoemia is the most common finding. The classic sign is Hampton's hump, but there are many nonspecific signs. A ventilation-perfusion lung scan (V-Q scan) is useful to rule out pulmonary embolism but has a 15% false-positive rate.

#### ***Ultrasound***

A subcostal 4-chamber view can assess right ventricular function. Compression ultrasonography can be used to show a deep vein thrombosis (DVT) in most cases of pulmonary emboli.

### ***Computed Tomographic Pulmonary Angiography (CTPA)***

This is now regarded as the best investigation for pulmonary embolism.

In pregnant women, the choice of investigation is either CT or a V-Q scan, bearing in mind that both have radiation risks.

### ***Treatment***

- Emergency treatment is with aggressive oxygen therapy, fluids, and close monitoring of the patient.
- Avoid intubation as cardiac arrest is common when adrenergic drive stops.
- Patients should be treated with low-molecular weight (LMW) heparin and warfarin.
- Those with minor pulmonary emboli can be treated as outpatients.

With regard to small, self-limiting pulmonary emboli, a Swedish physician in the audience pointed out that these are very common, almost to the point being normal, and may be best not treated with potentially toxic drugs. He considered that the pursuit of small pulmonary emboli was verging on over-investigation and over-treatment. The lecturer did not disagree with this point.

### **Assessment of Headache**

While 98% of headaches are benign, a short lecture on their assessment by Prof Phillippe Bossart (Salt Lake City, USA) was subtitled "How to spot serious causes". The worst possible diagnoses that should be considered first include:

- Subarachnoid haemorrhage (SAH)
- Meningitis
- Carotid or vertebral artery dissection (especially in younger patients with stroke and headache)
- Venous thrombosis (hypercoagulable states)
- Hypertensive encephalopathy (very high BP; altered mental state)
- Mass lesions (focal neurology helps to diagnose these)
- Intracranial hypertension (often seen in young obese women; patients may feel better when standing)
- Temporal arteritis (age >50 years)
- Hypoxia, hypercarbia, carbon monoxide toxicity
- Narrow-angle acute glaucoma (with accompanying visual findings).



'Red flags' that should be looked for include:

- Sudden and severe onset of headache
- Atypical headache (for the patient)
- Neurological symptoms
- History of AIDS or cancer
- Family history of aneurysms or coagulopathy
- Fever
- Age >50 years.

### ***Examination***

This should include vital signs, eye signs, fundoscopy and a neurological examination.

### ***Indications for Computed Tomography***

Grade B indications for undertaking a CT scan include abnormal neurological examination findings, acute onset of severe headache, and new headache in HIV-positive patients.

Grade C indications include age >50 years with headache

The absolute necessity of a lumbar puncture (LP) for diagnosing subarachnoid haemorrhage if a CT scan is negative was emphasised.

### **Acute Coronary Events**

New definitions for acute coronary events and myocardial infarction were discussed by Dr Leo Bossaert (Antwerp), along with implications for clinical practice. Three studies [1-3] were presented that may prompt a rethink of current approaches:

- The use of morphine or glyceryl trinitrate in acute coronary syndrome (ACS) is associated with a worse outcome when corrected for other factors [1].
- A prehospital 12-lead ECG increases the mean on-scene time by 1.2 minutes but shortens the interval to treatment (door-to-needle time) by 36.1 minutes versus standard emergency medical care [2].
- A better outcome for French patients was noted when they were taken straight to the Cardiac Catheter Laboratory rather than Emergency Department.

## Cardiac Emergencies

A series of short oral presentations outlined recent research findings.

### ***Undiagnosed Acute Coronary Syndromes (ACS)***

A study undertaken at the Ha'amek Medical Centre, Israel compared the characteristics of patients discharged and readmitted with ACS *versus* those admitted for the first time with ACS. Between 2% and 10% of patients were discharged undiagnosed with what turned out to be ACS. Risk factors that were identified included hypertension, abdominal pain, and night-time presentation

### ***18-Lead ECGs***

Current recommendations are not to do 18-lead ECGs if a 12-lead ECG is normal. In a study of 689 patients presented by Dr Celine Michel (Poissy, France), an 18-lead ECG was done and 7.5% more cases of ACS were identified. This was 1.25% of all chest pain presentations; 4 of these were visible in the posterior leads and one in the right-side leads.

The number needed to test to find one extra acute coronary syndrome was calculated at 77.

### ***Global Registry of Acute Coronary Events (GRACE) versus Thrombolysis in Myocardial Infarction (TIMI) Risk Scores for Predicting ACS***

Around 8% of patients with chest pain are wrongly discharged. A study presented by Dr Richard Lyon (Edinburgh, UK) compared the features and predictive value of these scoring systems.

- GRACE (1-20 points): this system was considered complicated, as it has multiple scales within.
- TIMI (7 points): scored for both retrospective and major cardiac events recorded.

With both systems, there was a good correlation with each other and a good predictive value for subsequent cardiac events. In patients with normal TIMI or GRACE scores, no cardiac events occurred.

### ***Ability of the San Francisco Syncope Rule to Predict Serious Outcomes in the Elderly***

This rule was derived in February 2004 and a prospective validation was published in May 2006 [3]. Its components include a number of risk factors associated with a poor 7-day outcome, including:

- ECG abnormalities
- History of congestive heart failure
- Dyspnoea
- Systolic BP <90 mm Hg
- Packed cell volume (PCV) <0.3.

In a retrospective study of 388 patients aged  $\geq 65$  years presented by Dr Stephen Fallinger (Pennsylvania, USA), the sensitivity of the San Francisco Syncope Rule was found to be only 76.5% and its specificity 38.3%. Eight of 12 false-negatives had arrhythmias. It was concluded that this rule is not safe for use in the over 65 years age group.

### ***Fluid Therapy***

Recent controversies in fluid therapy were reviewed by Dr Eldar Soreide (Stavanger, Norway).

1. *Blunt vs penetrating trauma* – there are differences in the epidemiology of trauma that may influence opinion:

- USA – penetrating trauma more common
- Europe – blunt trauma affecting brain and other systems more common.

2. *Optimal resuscitation blood pressure* [4]:

- Severe brain injury – aim for systolic blood pressure 110 mm Hg
- Multi-trauma; no brain injury – aim for systolic blood pressure 90 mm Hg
- Penetrating trauma – aim for systolic blood pressure 70 mm Hg.

BP in trauma has its own course and is also dependent on analgesia and surgery, as well as fluids [5].

3. *Assessment of blood loss*: peripheral perfusion and level of consciousness are better guides than non-invasive blood pressure. A complete suggested stepwise approach to assessment was published in 2005 by Soreide & Deakin [6].

### ***Small Volume Resuscitation***

This lecture by Dr J Holliman (Pennsylvania, USA) reviewed the use of hypertonic asanguinous resuscitation.

A meta-analysis has shown that the survival of burn patients is increased by 12% with the use of crystalloid hypertonic fluids. It was noted that brain injury and external wounds in particular did better with this treatment. Military interest in the approach was high because of the smaller weights and volumes that need to be carried.

Early studies in animals used hypertonic saline (7.5% NaCl) in 6% dextran 70 or 5% dextrose. The hypertonic saline provided a rapid increase in mean arterial pressure which was sustained by the dextran. Increased survival was noted but there were problems with seizures and myolysis.

- Hypertonic saline-dextrose (1991) – increased survival in patients undergoing surgery
- Cochrane 2000 review (16 trials; 837 patients) – risk of death with hypertonic saline: 0.84 trauma; 1.49 burns; 0.62 surgical.
- Potential side effects of hypertonic saline – hyperosmolarity, hypernatraemia, immune suppression.

Fluids available:

- Rescue flow – 7.2% NaCl + dextran
- HyperHaes™ – 7.5% NaCl + 10% hydroxyethyl starch (HES).

These can be used by the interosseous route. Useful in pulmonary contusion [7] but no benefit was found on intrapulmonary shunting or on lung water.

*Hypertonic saline in brain trauma:* useful in hypotension as BP is increased without increasing intracranial pressure (ICP) [8].

*Traumatic brain injury:* no difference with hypertonic saline (HTS) versus normotonic saline, but the trend was in favour of HTS. Unfortunately, a lot of other fluids were used concurrently.

*Immediate or IV fluids study* (Houston, Texas): Characteristics of the patients were penetrating trauma and short transport. The delayed subjects did better but based on the injury severity score (ISS), they should have.

*Conclusion:* crystalloid is best. Limit fluids for penetrating trunk trauma and short transport. Use hypertonic saline for burns and head injuries.

## Major Disasters and the Emergency Department

The London Underground bomb attack in July 2005 was the first trial of new Disaster Management Protocols in London. Some lessons that were learned from this incident were discussed by Dr Gareth Davies (London) and several others who had been present.

It was interesting to hear, firstly, of the gradual way in which information that a major attack had occurred was received. Evidence gradually accumulated in various areas for 15 minutes until a major incident was declared, but it was not clear what exactly had happened until some time afterwards. The original thinking was that a fire had occurred in a tunnel and indeed, ambulances turned up at the wrong places for the first 10 minutes. Later, the appearance of casualties above ground made it appear that there had been 8 explosions.

Casualties began appearing at local hospitals about 40 minutes after the explosions. When it became clear there was a mass casualty situation, doctors were moved forward to the sites with paramedics, and off-duty staff were called in.

Communication was a major problem as the mobile phone networks were overloaded. Unfortunately, the previously arranged system of having protected phones for emergency services did not work well. Then, within the hospitals, phone networks collapsed which made intrahospital communication very difficult.

UHF radios were used to communicate between the sites but in future, the Emergency Services will try simultaneous multiple mode messaging (paging, texting, E-mailing) on the assumption that with this level of redundancy they will reach most recipients.

A medical problem not considered was human shrapnel from the bombers and others close to them. As a large number of body parts from other persons were found inside wounds, it was necessary to consider a hepatitis B and HIV risk and involve microbiologists early to assess the risk. In the end, hepatitis B immune globulin was administered but anti-HIV courses were not completed.

A lot of eye and ear injuries occurred, and separate teams were charged with dealing with these along with the primary surgical teams. The phenomenon of 'surge' within hospitals, especially in scarce theatre space, was a problem and one response to this was mini-laparotomies in those already in theatre for other problems to pre-empt a return for laparotomy later.

Another problem was gridlock. Although streets were closed for use by emergency vehicles, the areas around the bombing scenes were jammed with ambulances, etc. that had no way of moving as the crews moved into the underground network with their keys.

### **Terrorism-related Mass Casualties**

An Israeli surgeon (Dr P, Halpern, Tel Aviv) talked about his country's experience with bombings. An interesting point was that sometimes, the first concrete information arrived as casualties were brought in by car before the ambulances. These patients' outcomes, compared with those with the same injuries brought in by ambulance, were good and he did not discourage bystander 'scoop and run' practices.

Another interesting point was that they used a protocol of very widespread CT scanning of patients, which contrasted with the London hospitals use of mini-laparotomies at the time of other surgery.

### **Fever in Children**

A presentation by a prominent US Paediatric Emergency Physician (Dr R.E. Suter) reviewed strategies for assessing febrile children with no apparent source after a full history and examination but no investigations. This population comprises about 20% of febrile children. Recommendations were based on the American College of Emergency Physicians (ACEP) policy statement published in 2003 [10].

Firstly, children were divided into subgroups by age:

- Infants under 28 days – who should be presumed to have serious bacterial infection; and
- Children 3 to 36 months of age – who have been extensively studied.

Secondly, some of the strategies in use were examined:

- *Does a response to antipyretics assist in diagnosis?* Studies have shown that this approach should not be used for assessment of fever.
- *When are x-rays useful?* X-rays should be done in infants <3 months of age with respiratory illness, and in children >3 months of age with a temperature >39°C and white cell count (WCC) >20,000/mm<sup>3</sup>. Pneumonia is present in 20% of chest x-rays of febrile children <3 years of age, but all would have been picked up clinically.

- *Which children are at risk of urinary tract infection (UTI)?* Children at risk are those under 1 year of age and females with fever. Renal scarring may occur in up to 64% of cases of pyelonephritis, and there is a 10% to 20% risk of reduced renal function in adulthood. In this group it was noted that nonspecific symptoms were usually present – fever was the most common. Pyuria is not always present (up to 20%) in the under 2-year-old age group.
- *How to catch urine?* A bag/clean catch technique has a 0% to 29% risk of contamination. Urethral catheterisation has 95% sensitivity and 99% specificity and the risk of infection is low. Percutaneous bladder aspiration has the best sensitivity and specificity.  
*Recommendation:* use a catheter or suprapubic aspiration.

### **Management of Paediatric Fever**

The overall incidence of occult bacteraemia in the age group 3 months to 3 years is thought to be 1.5% to 2%. As regards the question of when to use empiric antibiotics, Dr Suter supported Baraff's Editorial [11] endorsing the use of empiric antibiotics where the WCC exceeds 15,000/mm<sup>3</sup>. However, in subsequent discussion of this point, Dr Richard Aikin (Auckland) recommended use of close clinical follow-up.

### **Children with Fever without Source**

Dr G. Campbell-Hewson (Edinburgh, UK) responded to the previous presentation from the viewpoint of clinical practice in Edinburgh. It was noted that the current policy [10] defines this group of children as those with a temperature  $\geq 39.0^{\circ}\text{C}$  but who are non-toxic. Difficulties include the fact that rectal temperatures are used in the US, but elsewhere other sites of measurement with poor correlation with rectal temperature may be used and the cutoffs vary by 1°C. In addition, toxicity is difficult to quantify.

As regards the suggested investigations:

- The WCC is used as a marker but the cutoff at 15,000/mm<sup>3</sup> (or a neutrophil count of 10,000/mm<sup>3</sup>) is based on population normative cutoffs rather than a correlation with bacterial infection.
- The use of chest x-rays in the under 3 month age group is suggested (Evidence level B) as consolidation is difficult to detect clinically.
- Oximetry – it is argued that the suggested 95% saturation cutoff may be too low, especially when tachypnoea is present.

- Urinary tract infections should be actively sought. The Edinburgh group uses the clean catch technique but there are rationales for other sampling techniques.
- The Edinburgh group consider that antipyretics may be used, but to see if they improve behaviour rather than lower the temperature.
- C-Reactive protein is not regarded as useful and procalcitonin is not being used at present.

It was pointed out that occult bacteraemia in itself is probably not an serious condition as studies have shown a 1% to 2% prevalence of *S. pneumoniae*, of which only 1% to 2% convert to serious infection.

## **Toxicology in the Emergency Department**

A lecture on poisonings by Dr M. Sabbe (Belgium) examined current evidence for management of selected poisonings.

### ***Measures to Reduce Absorption***

It was stated that vomiting and ipecacuanha could be consigned to history, while studies of gastric lavage had shown this approach to be extremely variable with a maximum of 30% removal of ingested substances and a lack of proven benefits.

- *Gastric lavage* may, however, be useful in the first hour or when a large amount of a toxic substance has been ingested. A contraindication to its use is loss of protective reflexes (present or anticipated).
- *Whole bowel irrigation* is thought to decrease the bioavailability of ingested substances but there have been no clinical trials of its use. It may be considered for slow-release drugs, paraquat, iron overdose, and body packers.
- *Activated charcoal*: the effectiveness of this measure decreases with time and there is no proven benefit. It does not adsorb cyanide, ethanol, ethylene glycol, iron, lithium, acids or alcohols.
- *Multiple-dose activated charcoal*: this can be used for slow-release drugs, poisons that have significant enterohepatic circulation, and poisons actively secreted in the gastrointestinal tract. This is also occasionally referred to as 'GI dialysis'.

### ***Specific Poisonings/Treatments***

- Hyperbaric oxygen – useful for carbon monoxide poisoning with loss of consciousness and neurological or ECG changes, and for pregnant patients.



- Hydroxycobalamin – useful for cyanide poisoning.
- 4-Methylpyrazole – in methanol poisoning. This agent is expensive but may be useful if dialysis or ethanol infusion can't be performed.
- Oximes for organophosphate poisoning – not proven; atropine should continue to be the main focus of treatment.
- Paraquat – early maximal treatment is needed (whole bowel irrigation, haemoperfusion).

## **Drugs of Addiction/Abuse**

A second toxicology lecture was on drugs of addiction and abuse. Dr Joanne Williams (Los Angeles, USA) discussed most of the perennial problems and a few recent and new ones:

### ***Amphetamines***

Multiple forms of amphetamines are now available and have a longer duration of action than cocaine, which may appear similar (although in New Zealand it is far more likely to be the former). The suggested treatment for amphetamine overdose is:

- Cooling
- Hydration
- Benzodiazepines
- Droperidol or haloperidol to lower the seizure threshold.

### ***Rave Drugs***

These include ecstasy (MDMA; methylenedioxymethamphetamine), heroin, cocaine, PCP (phencyclidine), and PMA (paramethoxyamphetamine; also known as 'Death').

- MDMA poisoning – heat stroke, hyponatraemia and cerebral oedema are the main causes of death
- PMA ('Death') – appropriately named agent. This is sold as MDMA and has been associated with deaths.

### ***Predatory Drugs***

These include Rohypnol® (flunitrazepam), ketamine, and GHB (gamma-hydroxybutyric acid).

- Rohypnol® – tasteless; causes sleepiness.
- Ketamine – similar to PCP; causes hallucinations and loss of orientation.
- GHB – sedative and steroid agent; induces sleep and, in combination with ethanol, may cause coma and death.

## Airway Management Strategies

A group of doctors from Bavaria discussed a lot of interesting equipment that is not really relevant to Accident and Medical clinics, but there were some pointers on emergency resuscitation and useful kits.

### **Bag Mask Valve Ventilation**

Studies show that 33% of cardiac arrest patients have aspiration, and even more trauma patients do so. This is because the lower oesophageal pressure drops to about 5 cm H<sub>2</sub>O in cardiac arrest. Looking at the available artificial airways:

- Laryngeal mask airway (LMA) – has no security from aspiration.
- LMA Proseal – leakage pressure 30 cm H<sub>2</sub>O but not so easy to use.
- Combitube – needs more training than the LMA but is a good back-up for impossible situations.
- Laryngeal tube – looks like a short Combitube.
- Intubating LMA – useful in failed airway and trauma; easy to handle and provides good prevention of aspiration.

## Overall View of the Conference

The European Society of Emergency Medicine (EuSEM) Conference is conducted in English and is usually held in a locality that is high in scenic and cultural merit. There is some North American input and overall, its content is similar to that of the Mediterranean Emergency Medicine Conference. However, it does provide a good international perspective and, along with the workshops, is a worthwhile CME conference.

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