

# Letters to the Editor

Need for non-invasive pain reduction strategies in neonates.

Sir,

The pain perception in neonates has been clearly described.<sup>1,2</sup> During the intensive care of neonates, they are exposed to many procedures, including intubation, IV access, central line placement, chest tube insertion, lumbar puncture, catheterization, suprapubic aspiration etc. These procedures are associated with pain and stress. However, no clear guidelines are available for alleviating the distress by premedication during such procedures. Researchers are looking for methods to minimize the pain and distress in neonates during these procedures. Examples include the use of thiopental as premedication before intubation,<sup>3</sup> local anesthetics before heel prick<sup>4</sup> and lumbar puncture.<sup>5</sup>

The goal is to choose a method of analgesia that is non-invasive and less painful. An intramuscular injection before an elective procedure is not acceptable. Similarly, patch therapy with local anesthetics or premedication will be a problem in acute situations, such as immediate intravenous access or emergency intubation. There exists an urgent need for randomized control trials on this issue. The questions are: what type of drug (analgesic, sedative or anesthetics) should be used in what procedures, what should be the mode of administration (IM, IV, ET or non-invasive), and what should be the dose adjusted for gestational age. We look forward to have some answers in near future.

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Thyroid surgery experience of King Saud Hospital, Unaizah, Al-Qassim.

Sir,

Over a period of 5 years, 70 patients underwent thyroid gland surgery in King Saud Hospital, Unaizah, Al-Qassim. Eighty five percent of the patient were females. Thyroid carcinoma occurred in 7% of the patients. Fifty percent of the studied group of patients presented clinically with multinodular goiter. FNAC was useful in determining the diagnosis, when performed, but the false negative results were of high incidence. Thyroid surgeries were safely and successfully performed in our hospital and operative complications were not more than complication rates in higher centers.

Thyroid enlargement is usually due to a variety of underlying pathologic conditions either neoplastic or non-neoplastic. Clinical distinction between these two pathologies is not usually possible. Several diagnostic modalities have been used such as thyroid function tests, scintigraphy and ultrasonography. Although these modalities can help in the detection of cold nodules, still they are not diagnostic. Fine needle aspiration of thyroid nodules has revolutionized the diagnostic approach to nodular goiters and is widely used in identifying malignant nodules and selecting patients for surgery. It was also helpful in limiting the number of surgical explorations for histologic examination in patients who would need only medical treatment, thyroid enlargement with either a solitary nodule, multiple nodules or diffuse enlargement is a common presentation in the outpatient clinic in our hospital. This prompted us to study the correlation between FNAC results with histopathologic examination. Also to study the most common thyroid pathologies encountered in Al-Qassim area and the sectors of population frequently affected.

King Saud Hospital is a secondary referral hospital for the population of Unaizah and the surrounding districts of Qassim area. The data of patients who have undergone thyroid surgeries for different thyroid pathologies during the period October 94 to October 99 were collected and included in this study. Records of 70 patients with thyroid enlargements were retrospectively reviewed. The collected data included patient's age, sex, nationality, clinical presentation, investigations carried out, surgical procedures, post operative course including operative complications and histopathological diagnosis. Special interest for correlation between the results of FNAC and histopathological diagnosis was included in our study.

During the period of 5 years from October 94 to October 99, 70 patients underwent thyroid gland surgery in our unit. Of these 49 patients were Saudi's and they form the basis of this report. Sixty patients (85%) were females with a mean age of 33.6 years at presentation (range 14-59 years). The mean age at presentation for males was 34.3 years (range 19-63 years). The clinical presentations and indications for surgery are goiter in 66 patients and 4 with toxic manifestations without palpable neck swelling. The investigations carried out to the studied group of patients were thyroid function tests in 49 cases, scintigraphy in 13 cases, ultrasonography in 6 cases, FNAC in 33 cases, while 5 patients did not undergo any special investigations.

FNAC results were conclusive in 25 out of 33 samples collected. It gave the results of colloid goiter in 7 cases, negative for malignancy in 10, follicular adenoma in 2, Hurthle's change in 1, benign follicular cells in 4, malignant cells in 1 and was not conclusive in 8 cases. The thyroid pathologies of the studied cases were nodular goiter in 33 cases, toxic goiter in 8, Hashimoto thyroiditis in 4, follicular adenoma in 13, papillary carcinoma in 5, simple diffuse goiter in 6 and a hemorrhagic cyst in 1 case.

It was noticed that two cases of multinodular goiter were associated with Hashimoto thyroiditis. Other cases of multinodular goiter showed foci of thyrotoxic changes. A fourth case of multinodular goiter showed follicular adenoma.

Post operative complications (morbidity rate) was 6 out of 70 patients (8.5%) which were hypothyroidism in 1 case, hypoparathyroidism in 2, recurrent laryngeal nerve injury in 1 and hoarseness of voice in 2 cases. Operative mortality was nil in this group of patients.

From our experience in King Saud Hospital in Unaizah, we have found that patients with thyroid enlargements are coming to ask for medical advice mostly for fear of cancer or for unsightly swellings. Reassurance and surgery were usually needed. We do agree for the attitude of surgeons practicing in our area to handle most thyroid swellings surgically, particularly those presenting as solitary thyroid nodules. Although malignancy was diagnosed only in 5 out of 70 cases in our study (7%) which is lower than the rates of malignancy reported in higher centers in Buraidah and Riyadh areas, we still recommend that all thyroid swellings should be handled surgically. Reviewing the results of our preoperative investigations, we found that thyroid function tests were conclusive in 49 cases, scintigraphy was conclusive in 11 out of 13 cases while ultrasound was conclusive in 5 out of 6 cases. FNAC was conclusive in 25 out of 33 cases (75%) which is nearly similar to reports coming from higher centers.

The correlation rate between histopathology and FNAC was 75%, which is consistent with the results of other centers. In a study carried out by Lowhagen et al, for 3500 patients undergone FNAC, false negative results was less than 2%. Another study carried out by Christensen et al, to correlate FNAC and scintigraphy, they confirmed that cases which were hot in the scan were benign in FNAC. It has been suggested that all patients with solitary thyroid nodule should have FNAC as their initial investigation and that thyroid scan is not required. It is also concluded that FNAC is an efficient method for detecting cancer in patients who have a cold nodule on the thyroid scan. Thyroid scan is of value in the follow up of patients who have had thyroid cysts aspirated.

It was found that multinodular goiter was the most prevalent pathology encountered in our area (33 out of 70 cases). Two cases presented with multinodular goiter were diagnosed as papillary carcinoma on a background of multinodular goiter. The pathology of multinodular goiter can not be diagnosed with confidence without surgery and pathology since most cases present clinically as a solitary thyroid nodule, which is in fact the more easily palpable of a multinodular goiter.

Thyroid surgeries were carried out safely in our hospital by a team of experienced surgeons without exceeding the morbidity or complication rates of higher centers.<sup>3</sup> Limitation of facilities did not prevent successful thyroid surgeries to be carried out in our hospital. Limited facilities such as lack of thyroid scan, lack of ultrasonic probe for thyroid gland examination, even thyroid function tests which were not available for most of the times. These did not prevent us from asking for these investigations from King Fahad Hospital in Buraidah, since a good number of patients still prefer to be operated in our hospital in the same district where they used to live.

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Biomedical Engineering Company announces its DISA S-Flex Coronary stent, Africa's first CE marked heart implant

Sir,

The Biomedical Engineering Company (BEC), a South African developer of cardiovascular products, is on the verge of a worldwide breakthrough after announcing international approval for its new generation coronary stent. The development of the precise, laser-sculpted implant which is used to open and maintain blood flow in the coronary arteries, builds on a long tradition of heart research in the Western Cape, home of the world's first heart transplant.

BEC, founded in 1998 by South African biomedical engineers, has received Class III CE Mark approval for its DISA S-Flex coronary stent. Dr Gregory Starke, CEO of BEC, says: "Although a number of international distributorships have already been established by our distribution partner, DISA Vascular, this exciting development now allows us to

rapidly expand our global marketing activities." The DISA S-Flex coronary stent is a new generation device, designed using extensive computer aided modeling technology to minimize restenosis by reducing the degree of vessel-wall injury during and after stent implantation. A 10%-20% incidence of restenosis, causing in-stent arterial narrowing remains the major negative side-effect of stenting. All major stent companies are racing to find a solution to restenosis.

Starke pointed out that preliminary clinical outcomes have shown excellent primary results. The unique S-Flex linkage provides unusually high flexibility for easy delivery and low-injury vessel-wall conformity, while the 8-cell structure provides more circumferential support than existing 6-cell stents. Based on a large body of independent, recent research, the developers believe that this combination is the key to a less restenotic implant.

Dr Basil Levetan, the Director of the Cardiac Catheterization Laboratory at Groote Schuur Hospital in Cape Town adds: "Over the last year my experiences with the DISA S-Flex coronary stent have been very favorable. It is easy to deliver and has produced excellent angiographic results."

BEC continues to develop innovative medical devices for the minimally-invasive treatment of vascular disease. BEC will release its peripheral stent in the first quarter of 2001.

In October 1999, BEC received venture funding from Catalyst Innovation Incubator (Pty) Ltd. Catalyst invests in early-stage life-science businesses. Starke noted: "It's been a tremendous boost working together with the internationally experienced Catalyst team in fast-tracking BEC's growth."

*Gregory Starke*

# Correspondence

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Pattern of admission in diabetics of Najran

Sir,

We read with interest the article on common causes of admission in diabetics.<sup>1</sup> With obesity and diabetes reaching epidemic proportions in Saudi Arabia<sup>2,3</sup> and a continued trend of its increase, it is quite important to know more about this disease in this particular community.<sup>4</sup> Knowledge about the magnitude of disease, level of education in diabetic subjects, pattern of admissions, availability of medical help, quality of available care, motivation of patient for treatment and available family and social support is important to look into the multiple variables relevant in proper care. We are actively collecting data in this regard and we would like to share our experience with the authors and other colleagues involved in the care of diabetic subjects in the Kingdom.

Najan General Hospital is a Ministry of Health hospital with its well-defined catchment area. All patients seen in primary care centers attached to it are referred to hospital for care. During the year 1420 (1999) we admitted a total of 2461 patients to our medical department comprising of 1452 males and 1009 females (male: female ratio of 1.4:1). A total of 480 males and 373 females were identified to have diabetes. This comprised of 33% male admissions and 37% female admissions. Just 12 patients (<0.5%) were diagnosed for the first time, others

were known diabetics. Following was the pattern of admissions in our patients based on the indication for that particular admission (Table 1). It is clear from the data that acute complications (hypoglycemia, hyperglycemia, ketoacidosis) were responsible for 166 episodes of admissions (19%) where as chronic complications were responsible for 314 (37%), 287 patients (34%) were admitted for a concomitant hypertension and 86 patients (10%) were admitted for other medical illness. Hypertension with other macrovascular complication were responsible for 67% of our admissions. We fully agree with the authors that the risk factors for macrovascular complications are smoking, hyperlipidemia, hypertension, obesity and smoking almost all of them reversible or controllable. Control of these factors may lead to a drastic reduction in hospital admissions and probably a reduction in morbidity. However most of such a control will be achieved by patient education which has to be on a mass scale and which needs a strong commitment by health authorities. We believe that health education should be part of every doctor-patient encounter, but it is our personal experience that it alone is not enough. Unless a national level health education program is not taken up, things might not change at ground level. A healthy, lean, non-smoker, jogger, whose diet consists of balanced diet rather than kabsa and mandi, has to be projected as a national hero to infuse a concept of healthy lifestyle into the young generation. Saudi sportsmen could be ideal candidates for such an exercise.

*Latif A. Khan, Sarosh A. Khan*

**Table 1** - The pattern of admissions in our patients based on the indication for that particular admission.

Disease entity	Male (%)	Female (%)	Total (%) (Nearest whole number)
Ischemic heart disease Angina/MI/arrhythmias	149 (31)	76 (20)	225 (26)
Hypertension	145 (30)	142 (38)	287 (34)
Strokes	29 (6)	18 (5)	47 (5)
Infections (lung/kidney)	28 (6)	27 (7)	55 (6)
Diabetic foot ulcer	18 (4)	X	18 (2)
Diabetic ketoacidosis	5 (2)	6 (2)	11 (1)
Hypoglycemia	9 (2)	4 (1)	13 (1.5)
Hyperglycemia	62 (13)	80 (21)	142 (17)
Diabetic renal disease	12 (2.5)	12 (3)	24 (3)
Miscellaneous	23 (5)	8 (2)	31 (4)
Total	480 (56)	373 (44)	853 (100)
X=Zero			

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## Reply from the Author

I am grateful to each of the authors for their interest in my article and in the care of diabetic subjects in the Kingdom. I totally agree with them, diabetes is reaching epidemic proportion in Saudi Arabia. We need more studies from different regions of the Kingdom in addition to our studies to show the magnitude of the problem we are facing and to augment the role of health education and social support all over the Kingdom. This will not only decrease the rate of admissions of diabetics but also reduce their morbidity, mortality and cost.

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Diabetes and perinatal loss, a continuing problem

Sir,

I have read with great interest the article titled "Diabetes and perinatal loss, a continuing problem."<sup>1</sup> The Perinatal Mortality Rate (PMR) in the abstract was calculated as a percent when it should have been calculated as per thousand as shown in Table 3 of the article.<sup>1</sup> The Cesarean Section (CS) rate was 5 times higher in the cases than in the controls. In our institution the CS rate of 13% for Gestational Diabetes Mellitus (GDM) on diet was similar to other obstetric population (12%), but CS on GDM requiring insulin was twice the controls (26% vs. 12%).<sup>2</sup> The table shows a comparative data,

incidence and perinatal loss in diabetics at the Riyadh Armed Forces Hospital (RAFH). Of the 44307 mothers delivered between 1994 and 1999, 236 (5%) were labelled as gestational diabetic, 730/2316 (31.5%) required insulin treatment.

The incidence of GDM at RAFH ranged between 3% and 7% with an overall incidence of 5% while the incidence of true diabetes on insulin varied between 0.5% in 1994 and 2% in 1998, because most of previously labelled gestational diabetics were classified as true diabetics and required insulin therapy from the beginning of their pregnancy. The perinatal mortality rate for gestational diabetics was twice (24% per thousand) the overall PMR while PMR for established diabetics was 4 times the overall rate.

This data supports the view of the author<sup>1</sup> that diabetes in pregnancy is still a major cause of perinatal loss. This data illustrates our concern regarding screening and management of diabetes mellitus in pregnancy whether gestational or established diabetes. Regular follow up and close monitoring of blood sugar level in pregnancy and management on outpatient basis is the cornerstone of successful outcome. There is still a lot which needs to be done to reduce the PMR in diabetics to its similar level in normal population.

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**Table 1** - Comparative table, incidence and perinatal mortality in diabetics (RAFH 1994-1999).

Year	94	95	96	97	98	99	Total
Total mothers	7003	7246	7711	7590	6897	7860	44307
Total infants	7082	7331	7801	7679	6990	7961	44844
Overall perinatal mortality rate	12.5	14	12	13	13	14	13
Gestational diabetes mellitus	394	365	477	541	216	323	2316
Incidence (%)	6	5	6	7	3	4	5
Perinatal death	9	9	9	11	10	8	56
Perinatal mortality rate per thousand	23	25	19	20	46	25	24
True diabetic on insulin	34	33	40	48	130	53	338
Incidence (%)	0.5	0.5	0.5	1	2	1	1
Perinatal deaths	5	3	5	3	2	2	20
Perinatal mortality rate per thousand	147	91	125	62.5	15	38	59

## Reply from the Author

We thank Ratib Mesleh for the comments on the article "Diabetic and Perinatal loss, A continuing problem"<sup>1</sup> and also the data on diabetes and pregnancy from their institution that was presented. We agree that perinatal mortality rate is and should be calculated per thousand for international comparison. Nonetheless, it is still acceptable if percentage is used bearing in mind that both units are easily convertible. The perinatal mortality rate for all diabetic patients in our study was about 5 times more than that of non-diabetic controls<sup>1</sup> while Dr Mesleh quoted perinatal mortality rate for established diabetics that was 4 times the overall rate. It is pertinent to note here that our study included patients with well controlled and uncontrolled blood sugars. Several studies<sup>3,4</sup> have shown the effect of tight control of blood sugars during pregnancy on perinatal mortality. It is obvious therefore that one way of reducing perinatal mortality in diabetics whether gestational or established is maintaining euglycemic state throughout pregnancy. The increase in cesarean section in our diabetic patients and Dr. Mesleh's may be related among other things to the birth weight, which is significantly higher in diabetic patients as in our study. However, Combs<sup>5</sup> demonstrated in his study that fetal macrosomia is related to postprandial glucose levels. It may deduced then that maintaining a normal postprandial glucose level during pregnancy may result in the reduction of cesarean section performed in diabetic patients. We agree that there is still a lot to be done to reduce perinatal mortality rate and the cesarean section in diabetics and the cornerstone is maintaining a euglycemic state throughout pregnancy.

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## Multiple choice questions in medical schools

Sir,

I sympathize with our Sudanese colleagues. The problems reported by Ahmed et al<sup>1</sup> during the preparation; and validation of multiple choice questions (MCQs) in Sudanese Medical Schools give me a feeling of *deja entendu*. Issues related to MCQs have been a matter of debate amongst academic staff in all medical schools including at our medical college. Although there is no single best answer to each one of the problems raised, I would like to comment on some of the observations reported.

Large number of students resulting in crowded examination rooms together with low student/invigilator ratios are known to be catalysators for students' misconducting behavior during MCQ examinations. There is however a simple and inexpensive solution to circumvent this problem, being the use of at least three versions of the same MCQ paper in which the questions have been set in a different order. In our experience, this obviously discouraged students from 'seeking help' from their fellow students during the examination. I believe that in an era where information technology in education is ample, this remedial solution should be realistic.

I do agree that writing of well-constructed MCQs demands a lot of experience and that critical review of the MCQ paper is essential even after the examination. It was however not clear from the authors' report how this was or should be done. I presume that they allude to the use of the optical mark reader system which provides the ability of reevaluation of each MCQ for indices such as discrimination and difficulty. Needless to say that based on this fast and relatively inexpensive evaluation tool valuable questions can be selected for storing in the question bank.

I realize the need for essay questions as an assessment tool during the medical training. But as correctly pointed out by the authors, it needs the required English language skills which are often lacking in many medical students around the world. As a result some of these essays end up in telegraphic

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style format which gives way to ambiguity and loss of objectivity during interpretation and marking.

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## *Reply from the Author*

We highly appreciate the valuable comments of Dr. Deleu that addressed vital points. MCQs have been taking a rapidly increasing place in the evaluation programmes of medical school in the recent years. The disadvantages of MCQs are certainly outweighed by the precision by which the factual knowledge may be assessed by this technique which have come to stay!

Students misconducting behavior during MCQs examination is a serious problem that not only impairing the evaluation process but also can be considered as a predictor of future dishonest medical practice. We strongly agree that the method suggested by Dr Deleu would certainly discourage this malbehaviour. But this method, in rare

occasions may not discourage those who want to "help" their colleagues by offering them some true responses (especially in setting of crowded examination rooms).

In the view of the MCQs paper we much emphasize the construction of the questions which is the most critical factor in the final analysis of such questions. Certainly, incorrectly or ambiguously worded MCQs will not yield worthwhile results.

A good English language is an essential requirement for answering the essay questions. Lack of language skills should not obviate the need of these questions. We feel that English should be meticulously taught in the preliminary year (which has been shortened to few months in most of our schools).

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## Book Reviews

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Dates in Medicine. A chronological record of medical progress over three millennia.

ANTON SEBASTIAN. 436pp. **Price:** US\$ 58.00. **Publisher:** The Parthenon Publishing Group Lmt, Lancaster, UK. **ISBN:** 1-85070-095-8.

This book provides a very brief overview of the progress of medicine from 800 BC to date. It contains a good overview and will be very useful for somebody who wants to know the history of medicine. Unfortunately, there are no references, and I would like to see in this book such information to help others how to find more data if needed.

In conclusion, I advise physicians or scientists who are interested in the history of medicine to buy it, and I also recommend that it should be made available in any medical library.

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Sleep disorders and neurological disorders

ANTONIO CULEBRAS. 423pp. **Publisher:** Marcel Dekker, Inc. USA. **ISBN:** 0-8247-76054-4

Sleep is a fascinating topic. Neurologists are asked to see large numbers of patients with sleep disorders and the subspecialty of neurological sleep medicine has developed rapidly over the last three decades. This multi-authored comprehensive book is studying the sleep from the neurological perspective. It focuses on the neurological mechanisms and manifestations that underlie sleep and its disorders. It covers the sleep manifestations, in common neurological disorders with illustrative cases and extends into dimensions of pathophysiology, treatment and prevention. The book consists of 20 chapters. The initial chapter covers the historical perspective on sleep and man. The second chapter is on neurobiology and segmented neurology of sleep. The third and fourth chapter provide important information on sleep disorders in children and pediatric sleep physiology and apnea syndrome. The chapter on dissociation of brain and mind such as narcolepsy and phantom limb phenomenon is

comprehensive and interesting one.

Chapter 7 is devoted to the role of melatonin in sleep and sleep disorders.

There were nine chapters covering sleep disorders in neurodegenerative disorders, extrapyramidal disorders, dementia, stroke, epilepsy, headache, brain injury, multiple sclerosis and neuromuscular disorders. Chapter 9 is on motor disorders of sleep such as sleep walking and nocturnal paroxysmal dystonia and chapter 16 is on narcolepsy, idiopathic hypersomnias and periodic hypersomnia.

The text is outstanding and very useful for neurologists and sleep specialists. Other physicians such as pulmonarists, psychiatrists and resident physicians will also find this book helpful. This book is an excellent buy especially for neurologists and sleep specialists.

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Mastering Documentation

DORIS WEINSTOCK, PETER, H. JOHNSON. 435pp. **Price:** US\$: 42.95 **Publisher:** Springhouse USA. **Date of Publication:** 1999. **ISBN:** 0-7506-4073.

This book thoroughly reviews the many aspects of the process of documentation. It is directed primarily at nursing students but would serve as an excellent reference book for any professional that wants to improve the documentation of care they have rendered to a patient. Although professionals tend to view documentation as a necessity, our entire careers can depend on the accuracy and completeness of charting entries.

In a practical way this book compares and contrasts the many different systems for documentation. One chapter focuses completely on the medical-legal aspect of documentation and the ethical implications. It is based on the American Nursing Association's "Standards of Nursing Practice" which are included as an Appendix. Three chapters are devoted to documentation in specific settings: acute care, long-term care and home care. These chapters are very comprehensive and focus specifically on documenting the care given in each setting. This book could serve as a useful resource for any hospital that is looking to develop new documentation forms or updating forms that are currently in use. It is abundant with examples of



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forms ready to be adapted for use in any facility and there are special sections labeled "Better Charting" that are full of practical tips.

Although this book has been written to meet standards of documentation in the United States and the legal considerations are based on the U.S. legal system, it would serve as an excellent resource for nursing and medical students, nursing departments, and as a library reference book in the Kingdom. Mastering Documentation addresses with unique thoroughness the process of documentation for the new professional, and also has new ideas that will impress even the seasoned professional.

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### Rapid eye movement (REM) sleep

BN Mallick, S Inoue. 421pp. **Publisher:** Marcel Dekker Inc, USA. **Date of Publication:** 1999. **ISBN:** 0-8247-0322-7

This is a multi author book covering extensively the phylogeny, ontogenesis, physiology, pharmacology, molecular mechanisms and regulation of REM Sleep animals and humans.

In the beginning it describes the experiments related to the eyelid condition at birth with regard to brain maturation and REM Sleep components: muscle atonia, Ponto Geniculo Occipital spike, EEG desynchronization. Later on, it explains: 1) experimental evidence about the role of brain-stem

structures: mesencephalic reticular formation for (EEG desynchronization), perihypocretin nucleus for (marked atonia), peri-abducens nucleus for (REM), Pontis oralis for (theta rhythm within hippocampus), peribrachial area and Nucleus reticularis for (PGO), Nucleus gigantocellularis for (myoclonic twitch) and parabrachial nuclei for increased brain temperature, cardiovascular and respiratory changes). 2) Role of nor-epinephrine, serotonin, 5-HT<sub>1</sub> and 5-HT<sub>2</sub> receptors, GABA, (inhibiting REM off neurons in LC and DRN), hormones like melatonin, GH, Prolactin and endogenous sleep substances in REM regulation and modulation. 3) Energy production in the limbic cortex and in pons - mesencephalic tegmentum during REM by functional brain mapping. 4) Influence of REM on sleep apnea syndrome, the function of REM across age and sex. 5) Neuronal excitability and behavioral changes by REM sleep deprivation. 6) Reciprocal interaction of NREM and REM Sleep and its homeostatic regulation. 7) The last topic hypothesises a neuronal dynamic in a neuronal network model, where the author suggests that REM Sleep is responsible for "dreaming" which might contribute to the process of consolidation and maintenance of memories.

The book helps the understanding of the complicated subject like REM, it is an asset for the basic neuroscience researchers and professionals dealing with sleep laboratory and sleep disorders. On the contrary, it does not throw much light on the clinical aspects of REM. However, the writing style, mode of presentation and literature search are excellent. Therefore, the book should be available in all medical libraries.

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