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## The 4th Annual International Medical Students Meeting *AIMS Meeting* Supplement



**AIMS**  
MEETING  
ANNUAL INTERNATIONAL MEDICAL STUDENTS MEETING



# INTERNATIONAL JOURNAL *of* MEDICAL STUDENTS

***International Journal of Medical Students***

The *International Journal of Medical Students* (IJMS), is a peer-reviewed open-access Journal, created to share the scientific production and experiences of medical students worldwide.



**Cover photo**

Main Auditorium of the Egas Moniz Building, Faculty of Medicine, University of Lisbon.

# International Journal of Medical Students

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## The Key to Better Medical Education? Communication

Sandra Duque-Maurício<sup>1</sup>

The Annual International Medical Students Meeting (AIMS Meeting) is a conference held by students from the Lisbon Faculty of Medicine, Portugal, for all undergraduate students currently attending health science courses. Its 4th edition took place in Lisbon on March 15-17, 2013.

Since our first edition, we have been dedicated to communicating science and improving medical education. It all began four years ago, when a group of medical students came up with the idea of creating a new space for learning and communication among students, doctors and scientists. As a result, the ENJOY Med - a national medical students meeting - was born. Last year the ENJOY Med turned into the AIMS Meeting, its international counterpart, and here we are today, thanks to the tremendous support of our professors, sponsors and partners.

AIMS Meeting website  
[www.aimsmeeting.org](http://www.aimsmeeting.org)

After all, why is it so important to us to be able to communicate science? Simply because communication brings understanding and new ideas. Nowadays, Medicine is tackling grand challenges, as tomorrow's doctors WE are tackling grand challenges as well. So, we definitely need new ideas and new answers! The truth is we cannot do it alone, because together we can do better, which leads us to the concept of networks. We believe that all illuminating moments in science come from two different kinds of networks, both of which are equally necessary: first, the network of neurons and synapses inside our brains; second, the networks we create in the outside world. And this is what ultimately led us to organizing the 4th AIMS Meeting and partner with the International Journal of Medical Students.

Thus, this meeting as well as this partnership provides us with the opportunity to hear, share and learn from each

**Figure 1.** Check-in at the Welcome Desk

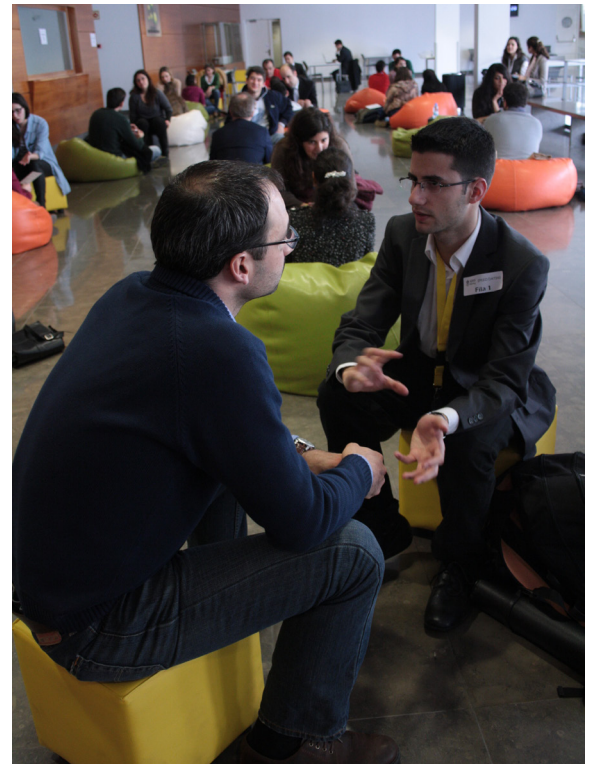


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**Figure 2.** Speed Dating with Researchers and Physicians



other's points of view and experiences. In other words, it provides us with the opportunity to create a new network through communication, keeping pace with our ideas and perhaps contributing to making "eureka" moments possible.

This year, we contributed to the creation of a network of 350 students from 15 different countries who attended our meeting. In addition, 40 of these students presented their research projects, whose abstracts can be read in this supplement. Oral and poster presentations are opportunities for students to be more than spectators, they become actors and tell the story of their scientific research.

Regarding the scientific program, the meeting focused on three different themes based on former participants' suggestions: Regenerative Medicine, Perinatal Care and Advances in Surgery. The guest speakers, who gave enlightening perspectives on these themes included Pedro Baptista (Wake Forest Institute for Regenerative Medicine, USA), Nikk Conneman (Erasmus Medical Centre, Sophia, Netherlands),



Figure 3. Laparoscopy Workshop during the 4th AIMS Meeting



Ryan Orosco (University of California San Diego, USA), among many others. In order to expand the focus beyond these thematic modules, we gave stage to a lecturer who explored a different subject each day, namely Rui Vieira Nery (Music and Medicine), Albino Oliveira-Maia (Stimulating the Diseased Mind) and Jonathan Howard (Mice Are Not Little Men).

The I Choose Sessions, a cornerstone of our meeting, allowed participants to attend practical activities of their choice, such as suture, laparoscopy, pediatric trauma and airway maintenance, while speed dating surpassed participants' expectations and it was the ideal opportunity to get to know doctors and scientists on an informal register. Once again, communication was the key.

Last but not least, we would like to challenge you to make a difference and be part of networks like the AIMS Meeting and the IJMS, working together towards better medical education.

Figure 4. Lisbon on Foot; an opportunity to (re)visit Lisbon..



Figure 5. Orthopedic Trauma Workshop during the 4th AIMS Meeting



Figure 6. Opening Session



# Abstracts of the 4th Annual International Medical Students Meeting

## POSTER Presentations

### Session 1 - March 15<sup>th</sup> 2013

#### 01 Toxicity and efficacy of Sunitinib in patients with metastatic clear-cell Renal Cell Carcinoma - new prognostic factors

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**Introduction:** Sunitinib is a multitargeted tyrosine kinase inhibitor (TKI) which targets VEGFRs and PDGFRs. It's the first approved targeted agent for the treatment of metastatic clear-cell Renal Cell Carcinoma (ccRCC). Data from clinical studies shown wide range of side effects, including fatigue, cardiotoxicity, hypertension and hypothyroidism. The aim of this study was to evaluate frequency of side - effects of Sunitinib in patients with metastatic ccRCC and to verify correlation of patients parameters and side - effects with progression free survival (PFS) and sustained clinical responses. **Methods:** Medical records of 153 patients (117M,36F) treated with Sunitinib in dose 50mg (28/14) were subject to analysis. Patients enrolled in the study were treated due to ccRCC since January 2007 in Department of Oncology. Mean age was 59,73 ( $\pm 10,59$ ) years. In 108 (80M,28F) cases Sunitinib therapy was terminated. All patients experienced toxicity of Sunitinib. Most common were: general fatigue, nausea and diarrhea. Sunitinib Induced Hypertension (SIHTN) was observed in 35% of patients, Sunitinib Induced Hypothyroidism (SIHTH) - 16%, cardiac side-effects (arrhythmias, MI, HF)- 10%, others < 10%. Analyses of blood parameters revealed: reduced Hgb level in 71% of patients, increased concentration of potassium in 48%, creatinine - 46%, Ast - 33% and Alt - 21%. Median PFS (Kaplan Meier method) was 410 days, mean - 480. Statistically significant ( $p < 0,05$  in Cox analysis) improvement of PFS was observed in subgroups of patient with: BMI>25, increased level of creatinine and potassium during treatment, SIHTN and SIHTH. Highest differences in median PFS were observed in subgroups of patients with SIHTN vs. normotensive - 629 vs. 287 days and with SIHTH vs. without - 678 v 366 day. Gender, past cardiovascular diseases, diabetes, time since nephrectomy, cardiac side-effects and other changes of blood parameters don't correlate with better PFS. **Results:** Most common and clinically important side-effects of Sunitinib treatment in patients with ccRCC are hypertension, hypothyroidism, cardiovascular disorders and changes in blood parameters. In this study we proved that SIHTN, SIHTH, BMI>25, increased level of creatinine and potassium play role as positive prognostic factors for patients with ccRCC treated with Sunitinib. **Conclusion:** Toxicity and efficacy of Sunitinib in patients with metastatic clear-cell Renal Cell Carcinoma - new prognostic factors.

#### 02 Modobentall operation - patients' profile and outcomes

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**Introduction:** A Bentall operation is a procedure performed in patients who were diagnosed of an ascending aorta aneurysm or a dissection accompanied by aortic regurgitation. In place of the diseased part of the aorta a graft is implanted and then the coronary arteries are re-implanted to the graft. The aim of the work was to show possible risk factors and disorders that can influence on the patients' condition, to evaluate mortality rate and presently reported complaints. **Methods:** The data base included 173 patients operated in the clinic in a period between January 2005 and October 2011. Achieved follow up was average of 869 days, based on 92,5%. The sources were medical documentation such as case records, surgical

and anaesthesiological charts and the phone survey with the patients. The majority of patients were male - 75%, the average age of 56,35  $\pm 12,04$  years. Length of hospitalization was 11,6 $\pm 10,4$  days. **Results:** 63% of admissions were urgent. Type A of the dissection was the majority - 69%. Ascending aorta's diameter was 57,95 $\pm 15,98$  mm. The most common additional disorders, that can have influence on the patients' treatment and their health are: artery hypertension - 61,9%, 38,46% suffered from coronary heart disease, 13,43% presented bicuspid aortic valve, almost equal percentage suffered from hypercholesterolemia and obesity suitable 15,4% and 15,9%. 39,8% - nicotine dependency. NYHA III or IV class was presented by 24%. 21,4 % had Bentall operation and CABG performed simultaneously. 80% cases required a conduit and the rest was treated by a prosthesis. The health condition of patients was evaluated in 5-grade scale. According to it 77% estimate their well-being as good and very good, 20% as moderate and 3% as bad and very bad. Although only 11,1% of cases were complication - free in and short time after the operation, currently 44% patients report no complaints. The mortality rate during stay in hospital was 19,9% and in long term observation 8,1%. If it comes to urgent admissions the mortality rate arises to around 21,4%. Age above 65 is important risk factor, and CABG with Bentall simultaneous procedures increase the risk of the death than the modoBentallsurgery performed only. **Conclusion:** The survival outcomes are satisfactory although the early mortality in urgent cases is high. A gold standard procedure burdened with many serious complications however severe, gives opportunities for recovering and life quality improvement. Moreover, re-entry to the casual life activeness and work is possible.

#### 03 Age factor in the surgery of pancreas - comparison of young and elderly patients undergoing pancreatoduodenectomy propter adenocarcinoma

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**Introduction:** Pancreatoduodenectomy (PD) is a method of surgical treatment of tumors located in the pancreatoduodenal field. It involves removal of the head of the pancreas with the duodenum and subsequent reconstruction of the continuity of the digestive system. Main recommendations for this surgical procedure are neoplastic tumors like pancreatic adenocarcinoma. Pancreatic adenocarcinoma increasingly occurs in younger age than in the past and development of surgery allows to operate elderly patients. Aim of study was comparison between morphological and histopathological characteristics of resected tumor and postoperative course of group of young and elderly patients undergoing pancreatoduodenectomy propter pancreatic adenocarcinoma. **Methods:** Retrospective case history analysis of patients who underwent pancreatoduodenectomy propter adenocarcinoma was performed. From 684 patients who underwent PD in years 2001-2012, 94 patients were divided into two groups: of young (<45) and elderly (>70) patients. The statistical analysis was performed by Statsoft STATISTICA v10. **Results:** The young group contained 24 patients, with average age of 41 $\pm 4$  years, the elderly group - 70 patients, with average age 74 $\pm 3$  years. There were statistically significant differences between group of young and elderly patients in terms of gender ( $p < 0,05$ ): 62,5% and 57% female patients respectively; of the operated tumor size ( $p < 0,05$ ): 4,4 $\pm 2,8$  cm and 3,8 $\pm 1,7$  cm respectively; of mean BMI ( $p < 0,01$ ): 22,1 $\pm 4,0$  and 25,2 $\pm 3,9$  respectively; of operating time ( $p < 0,001$ ): 332 $\pm 90$  min and 258 $\pm 63$  min respectively; of postoperative hospitalization ( $p < 0,05$ ): 16 $\pm 9$  days and 21 $\pm 11$  days respectively. There were no significant differences between group of young and elderly patients in terms of the method of digestive system reconstruction after PD ( $p > 0,05$ ): the most popular was the Traverso method; of intraoperative infiltration ( $p > 0,05$ ) res-



pectively; of intraoperatively analyzed vascular infiltration( $p > 0.05$ ); of the necessity of portal vein sewing and postoperative course. **Conclusion:** There were differences in gender range, the tumor size, BMI, the operating and the time the time of postoperative hospitalization between the age groups. The young group can be classified as mostly male patients, with a larger tumor and lower BMI, with shorter operating time and with shorter time of postoperative hospitalization. According to the literature, the operating conditions and the postoperative course of young and elderly undergoing PD are similar, our study confirm.

**04 Diagnostic value of combined quantitative contrast-enhanced harmonic endoscopic ultrasound and endoscopic ultrasound elastography in pancreatic focal masses**  
 Bilgar Adriana-Antonela, Dudau Mihaela  
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**Introduction:** Real-time endoscopic ultrasound (EUS) elastography provides strain assessment of a pancreatic focal mass. Quantitative assessment of tumor vascular enhancement through contrast-enhanced harmonic EUS (CEHEUS) with second generation contrast agents has been suggested as a useful diagnostic method. **Methods:** The aim of our study was to prospectively compare the diagnostic efficiency of quantitative assessment of tumor vascularisation by time-intensity curve (TIC) analysis and quantitative data resulting from EUS elastography when used individually and sequentially. We prospectively included 52 patients with chronic pseudotumoral pancreatitis (n=22) and pancreatic cancer (n=30). We performed CEH-EUS with 2nd generation contrast agents (Sonovue, 2.4 ml) and analyzed the arterial and venous phases, and consecutively plotted the corresponding TICs for lesions and normal parenchyma. The two resulting series of individual intensities were compared for malignant patterns. EUS elastography was consecutively performed in all patients and post processing software analysis was used to compute hue histogram data from dynamic sequences, as previously described. **Results:** For EUS elastography and CEH-EUS, the sensitivity/specificity/positive and negative predictive values were 86.6% / 36.3% / 76.9% / 23.1% and 86.6% / 72.7% / 81.2% / 80%, respectively. When the two methods were performed sequentially, we obtained significantly higher values - 93.3% / 81.8% / 87.5% / 90% compared to EUS elastography ( $p=0.0023$ ) and CEH-EUS ( $p=0.038$ ). Receiver operator characteristics (ROC) curve analysis showed the combined approach to be the most reliable, with an area under the curve (AUC) of 0.876 (standard error 0.0695, 95% CI 0.687 to 0.971) compared to 0.797 (SE 0.0838, 95% CI 0.594 to 0.928) for CEH-EUS and 0.615 (SE 0.0886, 95% CI 0.405 to 0.798) for EUS elastography. **Conclusion:** Using both EUS elastography and CEH-EUS seems to be the best option for the non-invasive investigation of pancreatic focal masses. Further large-scale multicenter studies are required to validate the diagnostic approach.

**05 Haemostatic disorders at patients with decompensated hepatic cirrhosis**  
 Nikola Vitlarov  
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**Introduction:** "Cirrhosis hepatis" is a chronicle progressive liver disease. The morphological changes of the injured liver cause damages with different intensity in his various functions. These damages directly affect the appearance of haemostatic disorders due to the liver role in the synthesis of clotting factors. **Aims:** To show the haemostatic disorders in patients with advanced disease stadium (ascites) who were treated in our Daily transfusion hospital and in the Internal ward Unit with plasma components (fresh frozen plasma and human albumin - 20%). **Methods:** From the Eastern part of Macedonia in the last five years, 103 patients were hospitalized and treated with plasma components and at the same time hematologic and biochemical analyzes were made of them. Also, haemostatic basic tests were made, such as: number of thrombocytes, the bleeding time( Duke), the prothrombin time ( Quick) shown as prothrombin activity in percent and INR, the thrombin time activated partial thromboplastin time (aPTT), capillary resistance and level of fibrinogen in serum. Reagents from Simens company were used. **Results:** In all

these patients there was a decreased number of thrombocytes under 150x109/L (in range of 90-115 x109/L); the bleeding time (Duke) mildly extended up to normal ( 3-6min.); protrombin time (Quick) strongly extended from 25,5 to 27,5 sec. or (45 to 40 %) and INR from 2,16 to 3,5; the thrombin time and aPTT were in normal range; capillary resistance positive with 2++ and fibrinogen level in serum under normal (1-2g/L). **Conclusion:** With the disease advancement of hepatic cirrhosis, the haemostatic disorders become more and more manifested. Brushings and bleedings are present due to the decreased productions of factors of prothrombin complex and also decreased thrombopoietin from progressive hepatosplenomegaly.

**06 Biologic agents in the treatment of plaque psoriasis**  
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**Introduction:** Currently available treatments for moderate to severe psoriasis are either incompletely effective in some patients, or associated with toxic effects. The availability of biologics in psoriasis is an alternative for this chronic skin disease. The objective of this study was to estimate the comparative effectiveness of two biologic agents indicated in the treatment of moderate to severe psoriasis, Etanercept(Enbrel) respectively Adalimumab(Humira). **Methods:** This study compares two groups of patients with plaque psoriasis from the Dermatology Clinic of Cluj-Napoca. The first group of 25 patients followed the therapy with 50 mg of Etanercept per week for a period between 6 months-2 years. The second group of 12 patients received 40 mg of Adalimumab every two weeks for a period between 6 months-2 years. Comparative effectiveness was estimated based on the reported Psoriasis Area and Severity Index(PASI) response rates and the Dermatological Life Quality Index (DLQI) score. **Results:** Data show an improvement of the skin lesions and PASI score with 88,88% in the group of Enbrel and the median decrease of DLQI score was 16 points after the follow up. In the Humira group, the mean improvement of the PASI score was 86,58% and the median decrease of DLQI score was 20 points. The patients from the Humira group had a significant lower of DLQI compared to patients from Enbrel group( $p<0,001$ ). There is no significant difference regarding PASI score between the two groups( $p=0,38$ ). At the end of the follow-up, 32% of the patients treated with Enbrel achieved PASI 90, and 50% of the patients treated with Humira achieved PASI 90(at least 90% improvement). **Conclusion:** Although the dose of Adalimumab is 40 mg every two weeks and 80 mg per month, the therapeutic effect is approximately equal with the efficacy of 50 mg of Etanercept per week and 200 mg of Etanercept per month. Our results suggest that Adalimumab is recommended for patients with moderate to severe plaque psoriasis because the dose is lower and the therapeutic effectiveness is better regarding the patient satisfaction and the quality of life. Further research is warranted to enable comparison of the psoriasis biologic agents after further long-term follow-up.

**07 Biomarkers versus cardiac index for preoperative risk assessment**  
 Ivana Mitic, Milos Markovic, Radmilo Jankovic  
 Faculty of Medicine, University of Nis

**Introduction:** Risk stratification prior to non cardiac surgery relies mostly on clinical risk scores such as the revised cardiac risk index from Lee et al. N-terminal B-type natriuretic peptide (NT-pro BNP). The aim of this study was to evaluate the incremental value of the NT-pro BNP for risk prediction prior to major non-cardiac surgery. **Methods:** In this prospective, single centre observational study, 87 patients were enrolled. Inclusion criteria were non emergent major non cardiac surgery, age above 55 years and at least one cardiovascular risk factor. Predefined endpoints were in-hospital mortality, and the combination of death, acute myocardial infarction, cardiac arrest, cardio-pulmonary resuscitation and acute decompensated heart failure. Secondary endpoints were total length of hospital stay and days at intensive care. Blood draw was performed within 4 days prior to surgery. NT-pro BNP was measured with an Elecsys assay. **Results:** From total 87 patients were enrolled, 9 patients (10,34%) deceased and 20 (22,3%) of the patients experienced the combined

end point. Total hospital stay was at median 13 (IQR 6-21) days. 49 (56.32%) did not need intensive care treatment, 21 (24.13%) one day and 17 (19.54%) two and more days at intensive care. There was a significant association of the Lee index to mortality (0.7% Lee index=0; 2.5% Lee index=1 and 5.0% Lee index . 2;  $p<0.001$ ) and combined end point (1.4% Lee index=0; 4.5% Lee index=1 and 9.9% Lee index . 2;  $p<0.001$ ). Preoperative levels of NT-pro BNP were elevated in those patients who died as compared to survivors (655 pg/ml vs. 132 pg/ml;  $p<0.001$ ). In the ROC curve analyses for the prediction of mortality NT-pro BNP was superior to the revised Lee index with an AUC for NT-pro BNP of 0.798 and for the Lee index of 0.622;  $p<0.001$ . Similar results were obtained for the combined endpoint, total length of hospital stay and number of days at intensive care. **Conclusion:** NT-pro BNP, a novel cardiac marker, provide strong prognostic information in patients undergoing elective non cardiac surgery incremental to the widely accepted revised cardiac index according to Lee. Implementation of the assessment of NT-pro BNP for risk stratification prior to non cardiac surgery should be recommended.

#### 08 Factors predisposing to death in case of acute renal failure following cardiac surgery

Anna Bogusawska, Karolina Cimer, Magdalena Klekot

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**Introduction:** Acute renal failure (ARF) constitutes a major problem after cardiac surgery and is leading to death despite the administration of renal replacement therapy (RRT). The aim of this study was to assess the factors predisposing to patients' death in the course of ARF following cardiac surgery. **Methods:** Retrospective analysis was conducted in a population of 10.657 adult patients operated in the Silesian Centre for Heart Diseases in Zabrze between 2003-2009. Patients undergoing heart or lung transplantation as well as patients on chronic dialysis prior to surgery were excluded from the study. Overall, 223 patients (2.1%) required RRT in the early postoperative period. Complete medical documentation was available in 204 patients (92%). Parameters assessed included: general demographic data, preoperative risk, type of surgery as well as biochemical and hemodynamic parameters at the time of the institution of RRT. Patients were divided into groups depending whether they survived or died. All the above mentioned parameters were compared between groups. The Chi2 and Mann-Whitney tests were used.  $p<0.05$  was considered significant. **Results:** Among 204 analyzed patients who required RRT, 147 patients died (72.1%). Death occurred among older patients ( $64.6 \pm 9.9$  vs  $58.1 \pm 13.4$  years,  $p<0.001$ ) but the preoperative risk determined by the EuroSCORE was comparable ( $7.4 \pm 3.3$  vs  $7.2 \pm 3.4$  points,  $p=0.58$ ). The frequency of preoperative renal failure was significantly lower among patients who died (12.9% vs 33.3%,  $p<0.001$ ). Patients who died more frequently had biochemical signs of liver damage, higher serum lactates, lower blood pressure and higher values of central venous pressure. **Conclusion:** Factors predisposing to death in case of ARF following cardiac surgery include older age and signs of multiorgan failure at the time of the initiation of RRT. Postoperative exacerbation of chronic renal failure is prognostically a better sign than postoperative ARF developing without renal disease existing already before surgery.

#### 09 The management of total hip arthroplasty in developmental dysplasia

Leonte Cristina, Bujor Iuliana-Elena

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**Introduction:** Total hip arthroplasty in the degenerative pathology secondary to the congenital dysplasia identifies itself by frequent technical difficulties and the distorted anatomy used as a background. The existence of a congenital hip dislocation unilateral or bilateral, untreated in childhood, will cause an irreversible deformation in adulthood. Hip function is affected by osteoarthritis changes or periarticular muscle insufficiency. Old and important instability remain well tolerated for long time, but finally causes irreducible painful osteoarthritis deformities. The subjacent knee works also in poor

mechanical condition and the impact of painful arthritis due to overcharge is also frequently and early, surgical orthopedic treatment applied to the hip in childhood disrupt growth, and cause distortion, laxity and osteoarthritis in adulthood. The study analysis the incidence of hip arthroplasty for osteoarthritis secondary to developmental dysplasia in all the cases of arthroplasty, the age of the patients at the time of the surgery, the type of deformity, the prosthetic components used and the functional results postoperative and in time. **Methods:** This study included 104 patients who received total hip arthroplasty for osteoarthritis secondary to congenital dysplasia between 1994 and 2011, at the Clinic of Orthopedics and Trauma of Rehabilitation Hospital Iasi, Romania. Deformity evaluation was performed using standard radiographs, using two classifications: Crowe and Hartofilakidis. **Results:** The incidence of hip arthroplasty for osteoarthritis secondary to developmental dysplasia was 3.34% of total arthroplasties in the period 1994-2011. 116 hip arthroplasties were performed in 104 patients, females had a superior prevalence of 89.42% (93 women and 11 men). Bilateral disease was present in 42.30% of cases (44 patients), of which only 12 cases of bilateral surgical intervention. Left hip was affected more frequently, in 67% cases. Regarding the type of dysplasia, 48% were patients with dysplasia or subluxation Crowe I, 31% patients with Crowe II subluxation and 21% Crowe III. Of the 116 prosthetic arthroplasties, 73 were uncemented (62.93%), 27 cemented (23.27%) and 16 hybrid arthroplasties (13.79%). **Conclusion:** Total hip arthroplasty on dysplastic hip is a complex surgery that requires a rigorous preoperative planning, correct intraoperative assessment of the anatomical changes, the usage of a precise prosthetic and optimizing long-term postoperative results.

#### 10 Classic and modern in the treatment of the hydatid cyst - the experience of a General Surgery Center

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**Introduction:** In the last 20 years we have experienced a substantial increase in the usage of minimally invasive therapies for patients with hydatid cyst (interventional radiology, interventional endoscopy, eco-guided puncture, laparoscopic surgery). We have analyzed and compared both surgical methods, the classic and the minimally invasive approach of the hepatic echinococcosis. **Methods:** The study includes 180 cases of hydatid cyst operated at 1st Surgical Clinic, St. Spiridon Hospital, Iasi, Romania, between 2004 and 2011. We selected for analysis the following variables: the location of the cyst, the type (according to the classification proposed by the Informal working Group of Echinococcosis), the surgical approach and technique, postoperative evolution, complications, recidivation and the association of chemotherapy. For the statistical analysis we used the non-parametric tests Mann Whitney U and Spearman with a p value  $p<0.05$ . **Results:** The lesions were treated by eco guided puncture (n=6; 3.3%), laparoscopy (n=48; 26.6%) and classic approach (n=126; 70.1%). The laparoscopic method uses: inactivation - aspiration - drainage and inactivation-aspiration-partial pericystectomy. The classic approach follows: inactivation - aspiration - drainage, inactivation - aspiration-partial pericystectomy, ideal pericystectomy, regulated hepatectomy, atypical hepatectomy. The minimally invasive approach correlates with type I and II cysts ( $p=0.016$ ) located in the 2nd, 3rd and 6th segments ( $p=0.001$ ). The length of postoperative evolution was significantly reduced after the laparoscopic approach ( $p=0.003$ ) compared with the evolution of the "minimal" classic intervention (inactivation-aspiration-drainage and inactivation-aspiration-partial pericystectomy) executed for type I-III lesions, but the difference between the number of days of postoperative care after the laparoscopic approach versus radical surgery (ideal pericystectomy, hepatectomy) is insignificant. We didn't come across important correlations between the recidivation/ complications and the surgery approach. The chemotherapy, used in 118 cases (65.5%) correlates significantly with a lower rate of recidivation, occurred in 9 cases (5%). **Conclusion:** The hydatid disease benefits today from a multimodal therapy in which chemotherapy, videosurgery, PAIR and classic surgery must complete and not exclude each other. Even though



the classic surgery loses ground, it remains the strategic background in the treatment of the hydatid cyst.

**11 Effects of physical therapy on activities of daily life in patients after cerebral stroke**

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**Introduction:** Cerebral stroke represents a chronic, massive and non contagious disease, which has pandemic occurring with continuing expansion. After stroke, reparative processes enables spontaneous recovery, but rehabilitation therapy can stimulate reorganization of neural mechanisms and make outcome of stroke much better. The aim of this research paper is to evaluate effects of physical therapy on activities of daily life (ADL) in patients after cerebral stroke.

**Methods:** In our scientific paper we used medical histories of 31 patients, of age between 38 and 87 years. Ability to perform ADL was evaluated with Barthel Index (BI), recently after stroke (1) and after 15 days (2). **Results:** Average age of all patients was 63,97±1,01 years. Ischemic stroke (IS) had 25 patients (80,65%), 13 males (52%) and 12 females (48%). Hemorrhagic stroke (HS) occurred in 6 patients (19,35%), 3 males and females (50%). Average value of BI 1 of all patients was 40,97±8,8, BI 2 was 51,29±7,20. It represented increase of 25,19%, statistically significant (t=5,25 and p<0,001). Represented results showed that physical therapy leads to obvious improvements to ADL. Average value of BI 1 in patients with IS was 40,2±7,64, average value of BI 2 was 51,2 ±6,26, statistically significant (t=4,58 and p<0,001). Average value of BI 1 in patients with HS was 44,17±12,95, average value of BI 2 was 51,67±10,91, statistically significant (t=4,41 and p=0,007). In patients with IS difference between average values of BI and BI 2 was 27,36% and 16,98% in patients with HS. The conclusion is that physical therapy gives better improvement to ADL in patients with IS than with HS. We determined that patients with female gender had significantly lower values of BI 1 (34,67 females, 46,87 males) and BI 2 (48 females, 54,37 males), but they showed more than double improvement of ADL (38,45% females, 16% males). The speech was preserved in 10 patients (32,26%), and this group had highest level of BI (60 ±4,85) and BI 2 68±3,17), also the lowest increase of BI 2 (13,34%), statistically significant (t=2,28 and p=0,049). Patients with aphasia had the lowest level of BI 1(13,34±13,53) and BI 2 (23,34±5,62), with highest increase of BI 2 (76,92%), statistically significant (t=3,1 and p=0,015). Between previous two group were patients with dysphasia/dysarthria with BI 1 value of (45,84±5,39) and B2 (58,34±4,80), and middle increase of BI 2 (27,27%), statistically significant (t=3,57 and p=0,020). Our results showed that there is no correlation between impairment of speech and BI and indirectly with ADL after physical therapy. **Conclusion:** Effects of physical therapy proved its purpose in all patients, especially with ischemic stroke and women gender. Level of speech impairment was not in correlation with ADL.

**12 Prevalence and causes of syncope in brazilian young adults**

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**Introduction:** To identify syncope prevalence and its main causes among young Brazilian population. The specific objectives were to understand the main preceding signs and symptoms, the duration of the episodes, the number of subjects that seek health care assistance and, for those, which complementary exams were conducted. **Methods:** A form was applied to 445 individuals with mean age of 20,37 (SD 3,73). The form was anonymous and required to check boxes and fulfill a few open questions. It was applied in Curitiba, Paraná's state capital, south Brazil (population of 1,8 Million). **Results:** Of the 445 subjects 32,81% of had at least one syncope episode to report. Prevalence among women was 39,46% and 19,18% among men. The gender difference is statistically relevant (χ<sup>2</sup>=28,32; p<0,001). Among the subjects that had an episode, 36,55% received medical attention and had a diagnosis (39,32% among women and 25% among men).

Hypotension (18, 87%), hypoglycemia (16,98%), vasovagal syncope (13,21%) and psychological causes (5,56%) were the most prevalent diagnoses. On the sequence of medical treatment, 22,64% had performed complementary exams. The mean age of occurrence of first episode was 14,74 years old (SD=3,76; n=31). The mean duration of each episode was 2,36 minutes (SD=1,93; n=25). The most frequent symptoms preceding the episodes were dizziness (21,2%), visual alterations (15,1%), sweating (9,6%) and nausea (9%). The most frequent symptoms following the syncope episode were headache (4,8%), palpitation (2,1%) and mental confusion (1,4%). **Conclusion:** The results concerning general syncope prevalence and the greater prevalence among women are in accordance with the data described by similar studies. Most of the subjects didn't seek medical attention after the episode and, among those who receive medical care, less than 25% were assessed with complementary exams. The most frequent diagnoses were related to autonomic, endocrinal and psychological causes.

**13 Neurobehavioral profile of healthy Brazilian newborns**

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**Introduction:** The Neonatal Behavioral Assessment Scale (NBAS) is an internationally used instrument, composed of different clusters, each one assessing a specific aspect of the child development, such as the central nervous system, the motor control, the level of consciousness and the interaction with the environment. It is an appropriate tool for detecting infant's strengths and difficulties, in different areas, being considered a reliable instrument. The literature lacks researches using this specific instrument in the Brazilian population. In this context, the aim of this study was to describe the performance of full-term neonates in the first week of life using the NBAS, comparing the results to similar studies. **Methods:** In a cross-sectional study, 36 healthy full-term newborns (37 to 42 weeks of gestational age), aged 1 to 3 days, were assessed using the NBAS (third edition). This instrument is composed of 27 behavioral items and 18 reflex items. The participants were recruited in the maternity Victor Ferreira do Amaral (Curitiba, Paraná, Brazil) which is part of Federal University of Paraná's hospitals network. Inclusion criteria were adequate weight and length of gestational age according to curves of native population, requirement of routine post natal care only and consent of the parents. The following conditions were exclusion criteria: any neonatal pathology, high risk pregnancy or Apgar score lower than 7 at 5 minutes. **Results:** The means of the behavioral items were in accordance with data reported by other studies, except for the Orientation cluster, which presented lower values. Boys presented significantly higher scores than girls in three items (pull-to-sit, hand-to-mouth and rapidity of build-up), which may indicate a better motor control. The NBAS showed good internal consistency regarding Orientation, Habituation and Regulation clusters (Cronbach's alpha 0,94, 0,86 and 0,73, respectively). The reflex items indicate variability in the responses of healthy neonates, with hipoactivity in walking, placing, incurvation, crawling and tonic neck deviation. **Conclusion:** The present study contributed to an initial comprehension of Brazilian neonates' profile in the NBAS. Researches with larger samples are suggested.

**14 Effect of passive smoking on the incidence of respiratory tract infections in children**

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**Introduction:** An increasing number of pathophysiological processes within the respiratory tract is associated with the negative effects of smoking. Nowadays, more attention is given to the impact of passive smoking on human health. This is particularly important when assessing the health of children. Aim of this study was to investigate the possible effects of passive smoking on the development of infections within the respiratory tract in children. **Methods:** The study was based on a authors' survey conducted in a two-way. Anonymous questionnaires were distributed to the pediatric wards of hospitals in Silesia and distributed on the internet through forums and portals

for young parents. The target group were the parents of preschool children. All data were analyzed by Statistica 8.0. **Results:** Among cigarettes-smoking parents only 5% come from cities > 100,000 inhabitants and 35% from villages <10,000. Average number of cigarettes smoked per day is mainly on level between 11-20, only 15% smoke more than 20, with an average of 7 at home and 5 at work. 80% do not smoke in the presence of a child. In this group the average number of children suffering in the last year of upper respiratory tract infection was 60%, bronchitis 25%, pneumonia 20%, bronchial asthma 10%. Among non-smoking parents' group these figures were respectively 70%, 40%, 40% and 10%. **Conclusion:** Research has indicated that the development of infection in the respiratory tract is a complex subject and passive smoking is only one of many factors. Further investigation is needed.

### Session 2 - March 16<sup>th</sup> 2013

#### 01 Development of in vitro bioengineered 3D autologous skin model

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**Introduction:** The most common reasons for major skin loss are thermal trauma – burns and scalds, that can result in rapid, extensive, deep wounds as well as chronic non-healing wounds. There is a substantial need for skin integrity restoration. The main goal of this study is to develop autologous 3D skin model that could eventually be translated into clinical applications. **Methods:** Dermal fibroblast and keratinocyte cell lines were extracted and characterised from skin biopsy obtained in accordance to Ethics Committee approval. Dermal cells were cultured within fibrin matrix thus obtaining 3D culture. To find optimal conditions for 3D tissue culture development, different concentrations of catalyator calcium gluconate and fibrin degradation inhibitor tranexamic acid were tested. Structure of cultured fibrin/fibroblast matrix was characterized using immunocytochemistry (ICC) method; functionality of the tissue culture was assessed by analysis of growth factor secretion (FGF-2, KFG). Primary keratinocytes and immortalized keratinocyte line (HaCat) were used to develop two-cell-type co-cultures in order to develop full-thickness skin tissue model. Effects of cryopreservation and tow different cryoprotectant variations on developed 3D tissue cultures were assessed – survival, cell proliferation and migration after freezing were assessed by cell migration monitoring in explant cultures and model integrity and structure by histological analysis. **Results:** Optimal concentrations of matrix components were found for 3D tissue establishment protocol. Three dermal fibroblast cell cultures showed good viability within fibrin matrix. Secretion data showed increased production of KGF in 3D tissue cultures. In establishment of full thickness tissue culture, HaCaT cells showed good results – formation of distinctive epidermal layer was observed. ICC using marker Ki-67 confirmed proliferation of epidermal cells in established tissue models. Different passages of two primary dermal fibroblast cell lines were tested in freeze/thaw experiments and data on optimal cultivation time (>28 days) prior to cryopreservation were obtained. Histological analyses and proliferation assessment approved better structural integrity and functionality of thawed samples that had been cultivated for prolonged periods before freezing. **Conclusion:** Methodology for cultivation of dermal fibroblasts within 3D fibrin matrix was developed, to produce fully autologous tissue with appropriate tissue structure and functionality. Cryopreservation methodology of 3D skin tissue cultures is suitable to achieve ultimate goal of an off-the-shelf full thickness skin model development. Methodology for establishment and cultivation of full thickness dermo-epidermal tissue cultures must be improved.

#### 02 Thermostability of humic acids and their effects on human skin cells in vitro

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**Introduction:** Skin, being the first physical barrier of our body that protects us from harmful environment, is functionally linked to the individual genetic background. One of the options to maintain its functionality is limiting the impact of negative factors that attack our skin. It can be achieved by highly efficient cosmetic products. Discovery of new, easily accessible, and natural compounds that can be beneficial for skin protection is essential also for medicine and pharmaceutical industry. Peat and sapropel has been used for medicinal purposes for many decades, however not much information is available of its mechanisms of action on skin cells. Our study uses humic acids (HA) from the lake's sapropel and peat. HA is one of the main constituents of peat and sapropel and important player to attribute therapeutic properties to mud. Little is known about HA structure and complexity; it is hard to predict effect of non-native environment on HA. It is believed that HA are thermostabile molecules, however HA extracted from different regions may vary greatly and thus their properties as well. The main aim of this study was to determine the thermostability and its biological effect on cells of 4 HA extracts by testing their influence on human keratinocyte proliferation. **Methods:** Immortalized human keratinocytes (HaCaT) were used as test system to evaluate proliferation of cells in cultures supplemented with 4 different fresh HA extracts and HA extracts that have been stored in three different temperatures for 5 months. Scratch tests and real-time proliferation observation system (xCelligence, Roche) were used for assess effect on cells. HA extracts used in experiments were dissolved in 0,2 M NaHCO<sub>3</sub> or DMEM. **Results:** Preliminary results indicate that fresh HA extracts stored at +4 °C induce the proliferation of HaCaTs at concentrations 1 - 10 µg/ml. Differences in potency to promote cell proliferation have been observed between tested HA extracts. 0,1M NaHCO<sub>3</sub> was used as solvent for HA and it was observed that over time HA lose their original colouring in it, so it was suggested that therapeutic properties might change as well, DMEM was tested as possible substitute for NaHCO<sub>3</sub>. It is expected that difference between HA extract effect on dermal and epidermal skin cells will be observed. **Conclusion:** There are ongoing experiments to evaluate chemical stability, optimal concentrations, solvent, storage temperature and 'best' before date for each HA extract. Effect of HA extracts on proliferation of different cell types (e.g primary keratinocytes and dermal fibroblasts) will be tested in further studies. Potential of fresh HA extracts to promote keratinocyte proliferation is dependent on HA extract concentration. It is essential to assess environmental quality when selecting potential peat or sapropel excavation sites because environmental factors play important role in in developing HA properties.

#### 03 Histological and genetic studies in recurrent meningiomas show relevant differences in male and female patients

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**Introduction:** Meningiomas are the most common neoplasms of all central nervous system tumors. Although the majority of these tumors are histologically benign, some of them usually recur. According to the World Health Organization (WHO) meningiomas can be classified into three histological grades: grade I (benign), grade II (atypical) and grade III (anaplastic) in accordance with the clinical prognosis. The genesis of the meningioma has been associated with loss of genetic material on chromosome 22 and other cytogenetic abnormalities. The purpose of this study is to analyze the implication of different chromosomal aberrations in recurrent meningiomas. **Methods:** For this study 34 samples of recurrent meningiomas from 31 patients treated surgically at the University Clinic Hospital of Valencia were selected. Cytogenetic studies were performed on primary culture and chromosomal analysis was performed on G-banded chromosome preparations. Karyotypes were described according to the International System for Human Cytogenetic Nomenclature. FISH analysis was realized when material was available using probes for chromosomes 1, 14 and 22. Hybridizations were carried out essentially according to the instructions that accompany the different probes.

The study was conducted with the informed consent of the patient and with the approval from the Institutional Review Board of our University. **Results:** From the 31 studied recurrent meningiomas, 19 were found in males and 12 in females. Twenty-two tumors were found in patients aging 50-75 and the other 9 were from patients aging 18-49. Eight meningiomas were classified as grade I, other 10 cases were grade II and the last 13 were considered grade III. Chromosomal aberrations were present in 24 cases and the other 7 recurrent meningiomas showed normal karyotypes and FISH. **Conclusion:** Chromosomal aberrations are more frequent in recurrent meningiomas than in primary tumors. Aberrations in chromosomes 1, 14 and 22 were the most frequent anomalies found by karyotyping and FISH studies consisting in partial loss of short arm of chromosome 1 and total monosomy of chromosomes 14 and 22. Furthermore, these abnormalities have been found in meningiomas which express more aggressive behavior and have a greater ability to recur. Interestingly, despite meningiomas are normally more common in females, recurrent meningiomas are more frequent in males and tend to express a higher histological grade.

**04 Quality of life and functionality in patients with benzodiazepine dependence**

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**Introduction:** Chronic use of benzodiazepines can cause benzodiazepine dependence. Benzodiazepine dependence is a disease that may, like other diseases, change one's quality of life and functionality. Quality of life is a broad ranging concept affected in a complex way by the person's physical health, psychological state, level of independence, social relationships, personal beliefs and their relationship to salient features of their environment. The aim of this study was to determine whether the degree of benzodiazepine dependence correlates with the decline of the quality of life and functionality of a person. **Methods:** The research included 63 psychiatric outpatients who used benzodiazepines for over 3 months and who had signs and symptoms of benzodiazepine dependence upon presentation. We used following questionnaires to obtain necessary data: a) the general sociodemographic questionnaire; b) Benzodiazepine Dependence Self-Report Questionnaire (measures the severity of benzodiazepine dependence on four domains: awareness of problematic use, preoccupation with the availability of benzodiazepine, lack of compliance with the therapeutic regimen, and withdrawal); c) World Health Organization Quality of Life-Brief (based on a four domain structure: physical, psychological health, social relationships, environment); d) Sheehan Disability Scale (to assess functional impairment in three interrelated domains: work/school, social and family life). **Results:** a) Quality of life, concerning physical well-being, was statistically significantly lower in subjects with marked indicators of benzodiazepine dependence: problematic use, preoccupation, prescribed dose non-compliance, withdrawal syndrome. Moreover, the decrease in the quality of life concerning psychological health correlated with the indicators of bad compliance ( $p < 0.027$ ), whereas in the case of environmental aspects it correlated with the degree of withdrawal syndrome ( $p < 0.0011$ ). b) Concerning functionality, high benzodiazepine preoccupation and withdrawal syndrome scores correlated to a decline in all three aspects of functionality (professional, social, family functionality), while high scores of bad compliance correlated to the decline in professional and social functionality, and scores of problematic use to the decline in professional functionality. **Conclusion:** Psychiatric patients with chronic use of benzodiazepine have a significant decline of the quality of life dominant in the field of subjective assessment of physical health and reduced functionality in professional, social and family life.

**05 In vitro development and basement membrane characterization of full-thickness tissue-engineered human oral mucosa**

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**Introduction:** Tissue engineering is aimed to generate tissue equivalents that ideally match the biological, histological and functional

properties of the native tissue, in order to provide an alternative solution to many oral and extra-oral pathologies. In this context, the generation of a functional oral mucosa substitute is strongly dependent on the development of a mature basement membrane. As an important component of the basement membrane, laminin modulates epithelial cell adhesion, differentiation and migration, and it is the most abundant structural and biologically active component of the epithelium-mesenchyme adhesion system. The aim of the present work was to generate human oral mucosa substitutes in vitro, and to analyse the development of the basement membrane through the immunohistochemical expression of laminin. **Methods:** Fabrication of bioengineered oral mucosa (BOM) was performed following the protocols previously developed by the Tissue Engineering Group of the University of Granada. Briefly, oral keratinocytes and fibroblasts were obtained from normal oral mucosa biopsies taken during minor oral surgery interventions by using enzymatic collagenase and trypsin digestion. These native tissues were also used as controls. For the preparation of the stromal substitute, we used fibrin and 0.1% agarose biomaterials with cultured fibroblasts immersed within, and keratinocytes seeded on top. After submerged culture for 2 weeks, the constructs were subjected to air-liquid interphase culture for 1 week to promote stratification and keratinization. Histological analysis were carried out on controls and constructs corresponding to 1, 2 and 3 weeks of culture. Hematoxylin and eosin staining, and immunohistochemical expression of laminin were performed. **Results:** In this work, we were able to develop full-thickness BOM composed of both human epithelial and stromal cells. Histological evaluation of the constructs revealed the progressive development of the epithelium, observing a simple epithelium in 1-week samples, 2-5 cell layers in the 2-weeks samples, and a differentiated multistratified epithelium after 3 weeks of culture. An integrated and well-formed artificial stroma was also present. Interestingly, an orthotypical pattern of laminin expression was observed, as a well-defined epithelial-stromal junction line, after 3 weeks of air-liquid interphase culture. **Conclusion:** In our study, we demonstrated the orthotypical expression of one of the main components of the basement membrane in an artificial human oral mucosa based on a fibrin and agarose biomaterial. Our results suggest that this biomaterial is permissive for the epithelium-mesenchyme interaction, which is fundamental for the development and functional maturation of complex tissues like the oral mucosa. Supported by FIS P111-2668 from the Spanish ISCIII.

**06 Identification of Pharmacological and Molecular mechanisms that inhibit secretion of TNF e IL-1 $\beta$**

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**Introduction:** Cytokines such as TNF and IL-1 are important effectors in pathogenic pathway of Sepsis and are a good option for new therapeutic targets. After studies in the lab where I am working on my Project, 45 candidate drugs were found, with high activity in inhibiting these two inflammatory mediators. Among the most active were three representatives of the group of anthracyclines, cytostatic used as antineoplastic drugs. The most active, epirubicin, was tested in a murine model of sepsis animals (CLP that produces a severe acute peritonitis). 80% or more of the untreated animals died 48 hours after CLP. In sharp contrast, 80-100% of the animals treated with epirubicin survived during 5 days or until they were sacrificed. In this project drugs will be tested in their ability to inhibit (or stimulate) the secretion of TNF and IL-1 $\beta$ . Objectives: (1) Test the drugs selected (cytostatics and drugs with similar pharmacological action) in their ability to modulate the secretion of TNF and/ or IL-1; (2) Use pharmacological and genetical approaches to identify the molecular pathways involved in the secretion of TNF and/ or IL-1 **Methods:** Drugs were tested on human cells of monocyte-macrophage line (THP1). The THP1 cell line was stimulated with E. coli bacteria in a ratio of 10 bacteria per cell for a period of 24 hours after pre-incubation with each drug. The concentration of TNF and IL-1 $\beta$  was measured by ELISA. The drugs effective with 10  $\mu$ M concentration were titrated to find the concentration that produces half of its activity. **Results:** Flu- mequinone, Azacitidine, Etoposide, Mechlorethamine and Altretramine



inhibit the secretion of IL-1, while Hidrocloromitoxanthrone, Daunorubicin, Doxorubicin, Epirubicin and Dactinomycin inhibit both TNF and IL-1 $\beta$ . **Discussion/Conclusion:** Some drugs like Fluoroquinolones and Antineoplastic Agents inhibit the secretion of IL-1 $\beta$  and TNF- $\beta$ , and may be useful in the treatment of Sepsis. Flumequine (Fluoroquinolone), Etoposide and Mechlorethamine (Alkylating Agent) inhibit only the secretion of IL-1 $\beta$ . Anthracyclines (Daunorubicin, Doxorubicin and Epirubicin) seem to be the most effective as they inhibit the secretion of IL-1 $\beta$  and TNF-. To understand in a better way the pharmacological and/ or molecular pathways that inhibit the secretion of TNF and IL-1 $\beta$  Fluoroquinolones will be tested in an in vivo model.

#### 07 Impact of free radicals on plasma molecules in multiple sclerosis

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**Introduction:** Important roles of reactive oxygen and nitrogen species (ROS and RNS) in pathogenesis of multiple sclerosis (MS) have been described in recent studies. We continued in that way further to elucidate its etiology and associated symptoms by measuring selected oxidative and nitrosative stress markers. As far as we know, this is the first study conducted to evaluate mutual correlations of these markers and correlations with the state of the blood-brain barrier (BBB) in MS patients. **Methods:** Blood plasma samples of 58 patients with relapse-remitting MS (test group) and 43 ones of healthy controls were analyzed. The function of BBB in MS patients was evaluated using the QA-index (ratio between albumin concentrations in plasma and cerebrospinal fluid multiplied by 1000). Total antioxidant plasma status (TAS), lipoperoxides, protein carbonyls, 3-nitrotyrosine and uric acid concentrations were measured. Results are presented as average value  $\pm$  SD. Student's t-test was used for evaluation of statistical significance. A p-value less than 0.05 was considered statistically significant. Correlations were characterized with Pearson correlation coefficient. **Results:** Our results confirm decreased TAS (1.41 $\pm$ 0.47 mmol/l vs. 1.91 $\pm$ 0.74 mmol/l, p<0.001) and increased lipoperoxidation (79.17 $\pm$ 50.7 nmol/ml vs. 46.62 $\pm$ 27.36 nmol/ml; p<0.001), which positively correlates with the state of BBB (r=0.289, n=58, p<0.05) in MS patients. Elevated concentration of protein carbonyls confirmed oxidative damage to plasma proteins (0.44 $\pm$ 0.08 nmol/mg P vs. 0.31 $\pm$ 0.01 nmol/mg P, p<0.001), which are also attacked by RNS, as proved by increased level of 3-nitrotyrosine (104.51 $\pm$ 38.43 nmol/l vs. 21.57 $\pm$ 3.67 nmol/l, p<0.001). There was a positive correlation between 3-nitrotyrosine and protein carbonyls (r=0.436, n=58, p<0.001). Physiological concentration of uric acid negatively correlated with protein carbonyls' level (r=0.328, n=58, p<0.05) while there was no significant relationship with 3-nitrotyrosine. This result suggests a role of this antioxidant in protection of proteins against oxidative stress, confirmed by the positive correlation with TAS (r=0.328, n=58, p<0.05). **Conclusion:** It can be concluded that ROS/RNS in MS patients affect a wide range of substances, change their properties and function. High concentration of lipoperoxides indicates a role of lipid peroxidation in deterioration of BBB. Free radicals attack lipid molecules in cell membrane, they can cause changes of their structure eventuating into loosening of BBB function and opening of central nervous system (CNS) to particles that cannot normally occur there including T cells. Considering the body complexity, extremely high levels of damaged proteins in blood plasma and abnormal state of BBB it should lead us to assumption of changed proteins in CNS that can activate immune system and result into autoimmune response. Therefore, it is necessary to pay attention to ROS/RNS reduction in therapeutic process to reduce damage to BBB and other adverse effects.

#### 08 Evaluation of the functional state of first-year medical students of the University under the conditions of the growth of information loads according to the data of ECG and EEG

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**Introduction:** Goal of the research: to evaluate the functional state of first-year medical students of the University under the conditions of the growth of information loads according to the data of ECG and EEG. To achieve this goal, the following research tasks were determined: 1. To analyze scientific data on the theme. 2. To investigate the functional state of the cardiovascular system of students during the first examination week and a month later. 3. To investigate the functional state of the nervous system of students during the first examination week and a month later. 4. To carry out statistical analysis, to analyze the obtained data and draw conclusions. **Methods:** Theoretical analysis of the literature on neurophysiology, neuropsychology, physiology, medical biophysics, pathological physiology, experiment, data processing and analysis. **Results:** 1. Literary scientific data on the study were analyzed. 2. The investigation of the functional state of the cardiovascular and nervous systems of the body of the first-year medical students of the University under the condition of the growth of information loads was conducted. 3. It was identified and experimentally confirmed that during the increase of the information load the body of a student experienced changes in the cardiovascular and nervous systems. **Conclusions:** 1. Increased information load caused no change in the index of the heart muscle tension and pulse changes in the first-year students. 2. Increased information load caused restructuring in the structure of the brain rhythms of the students. 3. The reaction of the brain to the increased information overload is individual. 4. Analysis of the data indicates adequate adaptive reactions to the increasing information loads of the first-year students.

#### 09 A comparative study of the effects of modafinil and caffeine on learning and memory in wistar rats

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**Introduction:** Modafinil is a medication with wake-promoting properties. It shows promise for a variety of indications including attention-deficit hyperactivity disorder, schizophrenia and cognitive dysfunction. Caffeine is present in many common beverages and presents numerous behavioral stimulant effects. **Objective:** To compare the effects of modafinil and caffeine on learning and memory in wistar rats. **Methods:** Morris water maze, Passive avoidance model with scopolamine induced amnesia, Spatial learning test using T-maze (4 groups of wistar rats in each model, 6 rats in each group.). Drugs used: modafinil 75mg/kg, caffeine 10mg/kg, rivastigmine 5mg/kg(oral) and scopolamine 0.5mg/kg(ip). Passive avoidance test: three stages-Exploration, Learning and Retention was tested after 24 hrs. Spatial learning using t-maze for spontaneous and rewarded alternation. **Results:** Morris water maze: Results were analysed using ANOVA and tukey Post Hoc test. The following depicts the group name followed by respective escape latency and time spent in target quadrant (in sec) presented as MEAN $\pm$ SEM : control 8.21  $\pm$  0.99, 14.03 $\pm$  1.00, caffeine 3.79  $\pm$  0.44, 19.08  $\pm$  1.51, modafinil 4.45 $\pm$  0.53, 27.37  $\pm$  1.40, rivastigmine 6.92  $\pm$  0.44, 24.28  $\pm$  2.22. Decreasing escape latency and increasing time spent in target quadrant is considered positive result. The following depicts the p-value for escape latency and time spent in target quadrant respectively control-caffeine: <0.001, 0.147, control-modafinil: 0.003, <0.001, caffeine-modafinil: 0.887, 0.008. Passive avoidance test: Following are the mean ranks of each group by Kruskal-wallis test according to their escape latency after retention testing (with scopolamine) control 3.67, caffeine 13.17, modafinil 15.33, rivastigmine 17.83 Chi-square(H)=13.805 and p-value=0.003. p-value for caffeine-modafinil was 0.423. Efficacy is in order of increasing rank with the most efficacious drug having the highest rank. T maze spontaneous alternation: correct alternations shown by different groups (maximum possible correct responses being 24) were, control 14.67 $\pm$ 0.211, caffeine 16.50 $\pm$ 0.500, modafinil 15.83 $\pm$ 0.601, rivastigmine 16.33 $\pm$ 0.211. The "p values" were found to be Control-caffeine 0.027, control-rivastigmine 0.048, control-modafinil 0.231, caffeine-modafinil 0.678. T maze rewarded alternation test: Correct response shown by different groups (maximum possible correct responses being 24) were, control 16.33 $\pm$ 0.422, caffeine 16.17 $\pm$ 0.307, modafinil 18.67 $\pm$ 0.760, rivastigmine 18.83 $\pm$ 0.167. The "p values" were found to be control-caffeine 0.994, control-modafinil

0.011, modafinil-caffeine 0.006. **Conclusion:** Both test drugs modafinil and caffeine showed improved learning and memory in wistar rats compared to control and performed well in comparison to the standard drug (rivastigmine). Modafinil showed greater improvement in learning and memory compared to caffeine in the passive avoidance model, morris water maze (time spent in target quadrant) and the t-maze rewarded alternation test.

#### 10 The Relationship Between Overcrowded Bedroom and Scabies in Al-Aqsha Dormitory

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**Introduction:** Scabies is a skin disease, which has four cardinal signs, those are pruritus nocturna (itching in the night), attacks a group of people, canaliculi find in the predilection area, and find *Sarcoptes scabiei* in microscopic examination. Overcrowded bedroom is believed to be one of the most prominent risk factor of Scabies beside bad hygiene and low socioeconomic level. This situation is usually found in dormitory where students have to sleep in overcrowded bedroom together. **Methods:** This study was conducted in Al-Aqsha dormitory in Jatinangor, West Java, Indonesia. Based on this, a study was conducted to find the relationship between overcrowded bedroom and scabies. This analytic observational and cross-sectional study used cluster sampling technique, eight bedroom with 207 students were selected from 31 bedrooms. The members of the rooms were examined by a Dermatologist with anamnesis and physical examination. A diagnosis of scabies used two cardinal signs which are pruritus nocturna and attacks a group of people. **Results:** 33 students are positive scabies, seven of them came from uncrowded room and the rest came from very crowded room. After being analyzed using Kolmogorov-Smirnov, the result showed a not significant relationship ( $p=0.639$ ) between overcrowded room and scabies. **Conclusion:** Another risk factor of scabies are bad hygiene and low socioeconomic level can be the reason of scabies in Al-Aqsha dormitory.

#### 11 AZFb microdeletions and oligozoospermia - which mechanisms?

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**Introduction** The aim of this work is to characterize the deletion patterns and its breakpoints in oligozoospermic patients presenting AZFb and AZFc microdeletions and to understand the recombination mechanisms underlying these microdeletions. For that purpose, there were identified two men with severe oligozoospermia and two men with nonobstructive azoospermia as having different AZFb+c deletion patterns via Y chromosome microdeletion analysis. **Methods:** The microdeletions and the fine characterization of the respective breakpoints were defined by sequence-tagged sites (STS) polymerase chain reaction (PCR) and single-nucleotide variant (SNV) PCR. The main outcome was the study of the fine structure of the Y-chromosome and discussion of the putative mechanisms involved in each microdeletion pattern. **Results:** From the four patients studied, three deletion patterns were identified: IR4/distal-P2 (25%; 1 of 4), P5/proximal-P1 (50%; 2 of 4), and P5/distal-P1 (25%; 1 of 4). Although severe oligozoospermia is normally associated with AZFc, a complete AZFb deletion was found in one case. **Conclusion:** Analysis of these patients has revealed a new putative region that may be involved in spermatogenesis conservation.

#### 12 Vomeronasal organ in humans: Anatomical and functional study

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**Introduction:** The existence and the shape of the vomeronasal organ is still an issue discussed in the literature. If in animals this organ's

existence and function is well known, in human it holds many unknown facts. The importance of this organ is that, if it exists and if it has a similar function as the one in animals, this could represent a type of unconventional communication between people. Some authors sustain that the vomeronasal organ in human is situated at the level of nasal septum, but they don't describe exactly neither its location nor its shape. In foetuses, the presence of the vomeronasal organ is noticed only in the first 19 gestational weeks, then it disappears with the perspective to find it again unilaterally in the adult period. In this study, our purpose was to answer at several problems related with the vomeronasal organ in foetuses and newborns, problems like: -The vomeronasal organ exists at foetuses in the last pregnancy trimester? -Where is it situated? -What is the shape of the vomeronasal organ? -Is there any nervous connexion between this organ and brain? **Methods:** The study was performed at the Anatomy Department of University of Medicine and Pharmacy from Craiova, on a lot of ten foetuses (six males and four females). Their gestational age was established by anthropometric measurements that determined the vertex-coxal bone length and the biparietal diameter, in each subject. The foetuses were fixed with formalin 10% for six months, then they were washed for two hours, dried and dissected. We performed a dissection of the anterior region of the nasal septum. At each specimen, we injected a tracer (in this case the tracer was duracryl; when the tracer hardened inside the cavity of the vomeronasal organ, it was dissected carefully using an operator microscope. We took a mold of this cavity and also we examined the cavity walls. **Results:** Despite all the discussions in the literature, we observed that the vomeronasal organ exists in all specimens and has the shape of a tennis racket. The existence of the vomeronasal organ in human embryo, as in other species, is certain. But this structure simplifies in the ontogenetic process. In adults, the presence of the vomeronasal organ was found unilateral. In this study we noticed bilaterally the existence of the orifice in all specimens. **Conclusion:** The vomeronasal organ exists in foetuses in the third gestational trimester. It is located bilaterally in all specimens. It has an obvious connection with the exterior, that can be found macroscopically. At the entrance, the septal mucosa and the glands are collector "funnel" shape. The shape of the cavity is racket (antrum and posterior cavity). It didn't show an actual nervous link between this organ and the brain, fact which can be a doubtful question about its human function.

#### 13 Disagreement between physician estimates and self-reported adherence to antiretroviral treatment in HIV1 infected adults

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**Introduction:** The evaluation of patient adherence to antiretroviral therapy (cART) by the physician is a common but difficult feature in the management of HIV infection. Misclassifications may impact the progression of HIV infection / AIDS. **Methods:** To determine the agreement between adherence estimates by the physician and self-reported by the patient, and to explore factors associated with disagreement between methods. **Results:** Cross-sectional analysis from the baseline evaluation of a prospective cohort study, with systematic sampling of HIV-1 infected adults prescribed cART and followed at the Infectious Disease Outpatient Clinic (Hospital de Santa Maria, Lisbon), with at least one medical appointment during the 3-month enrolment period (May-July 2011). Questionnaires were applied to both patients and their physicians. Each patient was classified as highly, mildly or weakly adherent by his physician and according to the Adults AIDS Clinical Trials Group (AACTG) Adherence questionnaire. Agreement between methods was measured, and kappa statistics were calculated. Hypothesis of association between independent variables (socio-demographic, behavioural and clinical) and adherence disagreement were tested ( $\alpha=5\%$ ). **Conclusion:** Adherence misclassifications by the physician are apparently common and could have an impact on the management of HIV infection. The need of standardized and evidence based nonadherence risk classification

seems necessary. Self-report seems easy to apply and has moderate to high specificity for nonadherence, and a classification that includes this method is apparently suitable. Further investigations with other methods of assessing non-adherence are needed to better characterize this question.

#### ORAL Presentations

##### 01 Adenosine A<sub>2</sub>A Receptors: novel upstream regulators of Brain-Derived Neurotrophic Factor mediated attenuation of hippocampal Long-Term Depression

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**Introduction:** Brain-derived neurotrophic factor (BDNF) plays a pivotal role in synaptic plasticity phenomena, namely upon long-term potentiation (LTP), in which its effect depends on adenosine A<sub>2</sub>A receptors (A<sub>2</sub>ARs) activation. However, its influence over a different type of synaptic plasticity, long-term depression (LTD), is yet poorly understood. Consequently, this work was designed: (1) to study BDNF effect upon LTD and (2) to determine the neuromodulatory influence of A<sub>2</sub>ARs. **Methods:** Field Excitatory Post-synaptic Potentials (fEPSP) were recorded ex vivo, from the CA<sub>1</sub> area of hippocampal slices (400 μm) taken from male Wistar rats (2-3 weeks old). LTD was induced through a Low Frequency Stimulation (LFS) paradigm (900 pulses, 1 Hz). Values henceforth mentioned are expressed as mean ± SEM, from n number of slices. Averaged LTD magnitudes were compared through ANOVA analysis with Bonferroni's correction. P-values < 0.05 were considered to represent statistically significant differences. **Results:** BDNF effect upon LTD is concentration-dependent, since in a low concentration (20 ng/mL) it does not change LTD magnitude (LTDBDNF<sub>20</sub>: -20.77 ± 2.93%, n=5 vs LTDCTR: -25.03 ± 1.87%, n=25; p>0.05), whereas in higher concentrations (60 ng/mL and 100 ng/mL) it significantly attenuates LTD magnitude (LTDBDNF<sub>60</sub>: -11.07 ± 1.94%, n=4; LTDBDNF<sub>100</sub>: -11.16 ± 2.12%, n=7; p<0.05, p<0.01, respectively, when compared to LTDCTR). Then, K<sub>252a</sub> (200 nM), an inhibitor of Trk phosphorylation, was shown to totally abolish the effect of BDNF (LTDBDNF<sub>100</sub>+K<sub>252a</sub>: -27.79 ± 4.25%, n=5; p<0.05, when compared to LTDBDNF<sub>100</sub>), demonstrating the involvement of Trk receptors in the aforementioned effect. Since BDNF effect upon LTP depends on A<sub>2</sub>ARs activation, we hypothesized that the lack of effect of BDNF upon LTD, in the lowest concentration (20 ng/mL), would be due to a low level of adenosine in the synapse, as a result of the LFS paradigm. And, indeed, the effect of BDNF (20 ng/mL) was unravelled by CGS21680 (10 nM), a selective A<sub>2</sub>AR agonist (LTDBDNF<sub>20</sub>+CGS21680: -2.04 ± 3.89%, n=5; p<0.05, when compared to LTDBDNF<sub>20</sub>). Finally, we documented that BDNF effect in the highest concentration is abolished by SCH58261 (100 nM), a selective A<sub>2</sub>AR antagonist (100 nM) (LTDBDNF<sub>100</sub>+SCH58261: -24.53 ± 1.27%, n=6; p<0.05, when compared to LTDBDNF<sub>100</sub>), proving that BDNF effect upon LTD depends on A<sub>2</sub>ARs activation by endogenous adenosine. **Conclusion:** Based on these findings, we propose A<sub>2</sub>ARs as new upstream regulators of BDNF-mediated attenuation of LTD. Furthermore, the interaction herein described opens up perspectives for the treatment of diseases for which an enhanced LTD magnitude is a pathophysiological mechanism, such as acute stress exposure and depression.

##### 02 Correlation between thyroid stimulating hormone (TSH) and oxidative stress in mixed dementia

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**Introduction:** The occurrence of mixed dementia, defined as the association of Alzheimer's Disease with vascular dementia, is increasing due to the global aging of the human population. Since thyroid

hormones play a role in cognition and alterations of the thyroid axis occur with aging it is reasonable to assume that thyroid function and cognitive decline in mixed dementia are linked. The objective of this study was to investigate whether there is a link between TSH, oxidative stress, cognitive decline and depression in female patients with mixed dementia. **Methods:** 40 patients with mixed dementia and 10 healthy controls were included in the study. The cognitive function was evaluated using the Mini-Mental State Examination (MMSE). Depression was evaluated using the Cornell Scale of depression. Malondialdehyd (MDA), Glutathion and Thyroid stimulating hormone (TSH) were determined from blood samples. **Results:** Serum TSH levels correlated with the cognitive decline measured by MMSE (r=0,55 p=0,0002) and with the depression score (r=0,34 p=0,0314). Furthermore an increase in the oxidative stress marker MDA (p=0,0004) and in the antioxidant defense marker Glutathione (p=0,0013) was observed in patients with mixed dementia. In addition we found a statistically significant correlation between the levels of Glutathion and the cognitive decline (r=-0,4997 p=0,001) and between the levels of Glutathion and serum TSH levels (r=-0,4997 p=0,001). No significant correlation was found between the depression score and oxidative stress. **Conclusion:** Our results suggest thyroid function, oxidative stress and the cognitive decline in mixed dementia are linked with each other. These data show that modifications in the level of TSH are associated with depression in patients with mixed dementia. Our study indicates a possible causal relationship between thyroid status, oxidative stress and cognitive impairment in patients with mixed dementia, but further experimental studies will be required to prove a cause-effect relationship.

##### 03 Generation of a reporter cell line to study the antigenic variation in *Trypanosoma brucei*

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**Introduction:** *Trypanosoma brucei* is a unicellular parasite that evades the host immune system by periodically changing the exposed Variant Surface Glycoproteins (VSGs from the cell surface) through antigenic variation. VSGs can only be transcribed from a specialized subtelomeric locus called Bloodstream Expression Sites (BESs). There are 15 BES in the trypanosoma genome but only one is active at a time and only one VSG gene out of hundreds is expressed in a monoallelic fashion. Unlike silenced BES, the chromatin of an actively transcribed BES is depleted of nucleosomes. The sequence of events related to the silencing and activation of BES is unknown. Understanding how the chromatin conformation depends on the tranblocktion levels, may help to identify key factors involved in antigenic variation. The purpose of my project was to generate a reporter cell line in *T.brucei* called GLB1A, which will be used for tranblocktion studies and to identify the conformation of the associated chromatin. **Methods:** Genomic DNA was extracted from GLB1A-TO cell line, in order to amplify a region of the active BES that contains GFP and Luciferase reporter genes, and BSD gene, which confers resistance to blasticidin. Two recombinant sequences from up and downstream of the region of interest were also amplified from GLB1A-TO. The fragments amplified were attached to a pre-defined vector, consisting of pFAB7. After amplification in bacteria, 10 μg of pFAB7 were digested with AscI and NdeI to linearize the vector, which was further purified through ethanol precipitation. 50 million cells from DH3 *T. brucei* cell line were transfected with DNA of interest. Transfected clones were selected with blasticidin 10 μg/mL. Clones that survived to BSD selection appeared after 6 days. DNA correct integration after transfection was verified in 6 GLB1A clones through 3 assays: FACS, Luciferase assay and blasticidin test resistance. **Results:** Several clones resistant to the selection were obtained and six of them were characterized. FACS showed GFP high levels due to the high tranblocktion in the active BES. Luciferase assay showed a great activity of this enzyme consistent with the levels expected when Luciferase is in the active BES. In the blasticidin test resistance, BSD was added to the medium in different concentrations (10, 30 and 50 μg/mL). Clones grew in all BSD concentrations, showing that GLB1A clones are resistant to high concentrations of blasticidin. **Conclusion:** As expected, the clones showed high tranblocktion of transfected genes. We concluded that



the transfection occurred as we were expecting, and the transfected cell line integrated Luciferase, GFP and BSD in the active BES.

#### 04 Prediction of fixation failure after surgical treatment of intertrochanteric fractures of the hip

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**Introduction:** Cut-out of the hip screw has been described as the most common form of mechanical failure after dynamic hip screw (DHS) fixation of intertrochanteric fractures. Tip apex distance, hip screw placement and neck shaft angle are indicators that have been used to assess the probability of cut-out. Measurement of these parameters implies an anteroposterior and lateral x-ray, however we ascertained that in the normal clinical setting a lateral x-ray is not commonly used. We intended to adapt these parameters solely to an anteroposterior x-ray to conclude about its reliability to predict the risk of cut-out. **Methods:** A retrospective analysis of all patients with intertrochanteric fractures treated with an internal fixation technique between January of 2007 and May of 2012 at Centro Hospitalar de S. João, Porto, Portugal. **Results:** The initial sample contained 214 patients who had sustained an intertrochanteric fracture. After application of the exclusion criteria, a final sample of 79 patients was obtained. Statistical differences were found in the simplified tip apex distance (STAD) and Parker's ratio (PR) measurements between cases of cut-out and uneventful healed patients, with higher values in those who suffered cut-out. Cut-out cases also presented a trend towards a smaller neck shaft angle (NSA). STAD, PR and NSA were also measured in the 8 patients treated with DHS who presented other types of mechanical failure in the initial sample. These were compared with the uneventful healed patients and no statistical association was found. **Conclusion:** An anteroposterior x-ray may be sufficient to assess the quality of fixation and predict the risk of cut-out. Patients who presented with cut-out had a greater simplified tip apex distance and a more superior position of the screw in the femoral neck. STAD, PR and NSA are not accurate parameters to assess the risk of occurrence of other types of mechanical failure.

#### 05 Antinociceptive and neuroprotective effects of EGCG treatment in an animal model of diabetic neuropathic pain

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**Introduction:** Diabetes is accompanied by several complications which may include painful diabetic neuropathy. It is responsible for spontaneous pain, mechanical hyperalgesia and tactile allodynia and affects more than 20% of diabetic patients with neuropathy. Previous findings demonstrated that diabetes induces oxidative stress damage at the spinal cord and brainstem regions involved in descending pain modulation. As to the latter, major oxidative stress damage has been detected at the serotonergic rostroventromedial medulla (RVM) and at the noradrenergic pontine A5 and A7 cell groups, along with loss of local neurons. Collectively these changes are likely to impair the spinal nociceptive neurotransmission and contribute to diabetic neuropathic pain. This study aimed to evaluate the effects of the treatment with Epigallocatechin Gallate (EGCG), a potent antioxidant present in green tea, on behavioral pain responses, spinal oxidative stress damage and in the integrity of serotonergic and noradrenergic neuronal populations of the RVM and A5/ A7 noradrenergic cell groups, respectively. **Methods:** Diabetes was induced in male Wistar rats by an intraperitoneal injection of streptozotocin. Control rats (CTR) received only the vehicle solution. Three days later, a group of STZ rats started a treatment with an aqueous solution of EGCG while the remaining experimental groups were given water (STZ+water and CTR), for 10 weeks. Before treatment and on its completion, mechanical hyperalgesia and tactile allodynia were behaviorally evaluated. Oxidative stress damage was assessed in spinal cord sections by immunodetecting 8-hydroxy-2'-deoxyguanosine, a

marker of DNA/RNA damage. Brainstem sections were processed by immunohistochemistry against tryptophan hydroxylase and tyrosine hydroxylase, the rate-limiting enzymes in the synthesis of serotonin and noradrenaline, respectively, in order to identify the serotonergic and noradrenergic neurons. Means were compared by One-Way Analysis of Variance followed by Tukey post hoc test for multiple comparisons. **Results:** Three days after injection, STZ rats presented hyperglycemia was not affected by EGCG treatment. The treatment with EGCG ameliorated the mechanical hyperalgesia and tactile allodynia detected in untreated STZ rats. These improvements were accompanied by a significant reduction of spinal oxidative stress damage in the STZ+EGCG group when compared with untreated STZ rats. The decrease in the numbers of serotonergic and noradrenergic neurons at the RVM and A5/A7 noradrenergic cell groups in the untreated STZ rats was prevented by the treatment with EGCG. **Conclusion:** The results of the present study show beneficial effects of EGCG in the treatment of diabetic neuropathic pain by eliciting neuroprotective effects in the spinal cord and pain control centres of the brainstem, giving rise to new perspectives on the development of therapeutic approaches to treat this condition.