Medical Faculty of Palacký University, Olomouc

XXXIII. CONFERENCE OF STUDENT'S SCIENTIFIC ACTIVITY

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Selected papers

Let us introduce the abstracts presented at the XXXIII. Conference of a Student Scientific Activities given annually by Medical Faculty of Palacky University in Olomouc and The Medical Students Club. This time it is the very first chance to present our work in a journal published in English. For a student who is interested and active in a field of science this is a great oportunity to show the outcomes of his work. For most of them is was an important lesson to learn. It is a step-by-step work and on its top there is a standart scientific product. It means that for a majority of students such work as a lecture or an article in the Czech language is more than a common thing. But what a challenge to come up with an expert text in English! Too hard? Unmanageable? Thanks to this great oportunity we found out that even such situation can be handled. We owe our gratitude to everybody who helped us on our way. Without helping hands our progress would not be that apparent and without professional support we would not face the right direction. Once again – thank you.

Radim Líčeník

FURTHER DEVELOPING OF MEASURING LATERAL RESOLUTION IN SONOGRAPHY

Ladislav Doležal, Vojtech Huser

Department of Biophysics, Faculty of Medicine, Palacky University, 775 20 Olomouc, Czech Republic

Key words: Sonography / Lateral resolution / Measurement

PURPOSE

Sonography is a modern, dynamicaly developing imaging technique in medicine. The quality of diagnosis is essentially dependant on the quality of the used sonograph instrument. One of its main qualitative parameters is lateral resolution rate (LR). Our project is to create a system of automatic processing of sonographical data in order to assess LR of various transducers and their final image.

METHODS

We used a small sphere of 0.4mm in diameter as a testing object. It's sonographic image was digitalized into a ***.BMP** picture format. Such BMP file was processed by previously developed programme *A-Profil*, which converted the bitmap BMP file into a ***.001** file. It consists of intensity values of each pixel in the sonograph view. This file used to be further manually processed in *Microsoft Excel* into the pre-final ***.TXT** file. (let's call this process *step beta*). Eventually was the *.TXT processed in program *Matlab*. Our goal was to create a new piece of software: program *Beta*, which would automatize work, done previously manually. Such software would significantly speed up the routine processing of one sonograph transducer.

RESULTS

After detailed analysis of the beta step, we suggested an algorithm and wrote a program in Pascal (computer programming language). Subsequently we tested its function on a set of data from 4 various transducers and compared the program results, whether they correspond with those done previously manually. This is important for incorporation of a new program into the sequence of measuring LR of a particular transducer. Our partial project thus uses the data, which were once already processed manually. Its goal was to speed up the whole procedure by our new program *Beta*.

CONCLUSION

We managed to create a useful tool in our project of measuring LR. This will in future enable us to process more transducers. We also plan to develop more algorithms to measure other parameters of a sonograph image, for which we have potential in so far obtained data (e.g. spatial resolution).

ENDOSCOPIC DIAGNOSTICS AND REATMENT OF UPPER DIGESTIVE TRACT HEMORRHAGE

Radim Líčeník[a], Vlastimil Procházka[b]

[a] *Faculty of Medicine, Palacký University, 775 20 Olomouc, Czech Republic*

[b] *2nd Internal Clinic, Palacký University, 775 20 Olomouc, Czech Republic*

Key words: Gastrointestinal hemorrhage / Upper digestive tract / Epidemiology / Endoscopy / Endoscopic hemostasis

BACKGROUND

Upper digestive tract hemorrhage is one of severe acute conditions in gastroenterology[1, 2, 3]. The aim of the retrospective study was to assess the frequency and causes in the catchment area of Teaching Hospital in Olomouc and to summarize the therapy approach to diagnosed bleeding.

METHODOLOGY

The retrospective study included patients examined for revealed signs of acute hemorrhage from upper gastrointestinal tract between 1 January 1999 and 31 December 1999 at the Department of Endoscopy, 2nd Internal Medicine Clinic.

RESULTS

During the observed period, 2,042 patients including 399 acute cases were examined. Acute gastroscopic investigation for revealed signs of acute hemorrhage from upper gastrointestinal tract was performed in 237 patients (69.9%) – 108 (45.6%) females and 129 (54.4%) males. The patients' ages ranged from 5 to 94 years with average age 60.5 years, median age 65.0 and SD±19.2. 104 (43.9%) patients were aged below 60 and 133 (56.1%) over 60. The causes for examination were melena in 111 (56.1%) patients, hematemesis in 94 (47.5%), hemochesia in 11 (5.6%) and only in 2 (1.0%) patients gastrointestinal hemorrhage was manifested by shock. Actively bleeding lesions were found in 91 (38.4%) patients while in 146 (61.6%) patients lesions had no signs of acute bleeding. The active bleeding causes were ulcer disease (56.1%) – gastric ulcer (28.6%), duodenal ulcer (25.3%) and esophageal ulcer (2.2%) – ruptured esophageal varices (12.1%), esophagitis (9.9%), hemorrhagic gastropathy (9.9%), Mallory-Weiss tears (7.7%), congestive gastropathy (2.2%), gastric tumours (2.2%), hiatal hernia (2.2%), gastric varices (1.1%) and other causes (3.3%). Endoscopic hemostasis was performed in 112 (47.7%) patients, 123 (52.3%) patients received no endoscopic therapy. In 86 (94.5%) patients primary hemostasis was obtained. Other therapies were used including injection sclerosation (Aetoxysklerol) in 87 (37.0%) cases, 96% alcohol in 29 (12.3%) cases, hemoclip in 1 (0.4%) and surgical treatment in 1 (0.4%). The average age of 146 patients without active bleeding was 59.33 years, SD±19.64 and the average age of 91 patients with endoscopically diagnosed active bleeding was 62.32 years, SD±18,40; $p = 0.244$ in t-test. 37 (40.7%) patients with active hemorrhage were younger than 60 years of age, 54 (59.3%) were older than that; $p = 0,430$ in Chi-Square Tests. The significance level during the comparison of active bleeding occurrence in Chi-Square Tests in individual months was 0.714.

CONCLUSIONS

Acute gastroscopy is most often performed after melena and hematemesis. The most common causes of active bleeding from upper gastrointestinal tract are peptic lesions. Primary hemostasis was endoscopically obtained in 94.5% patients with diagnosed active bleeding. There is no significant relation between frequency of upper gastrointestinal tract bleeding and increasing age. Neither is the bleeding frequency significantly related to individual months of the year.

REFERENCES

1. Skok, P. (1998) The epidemiology of hemorrhage from the upper gastrointestinal tract in the mid-nineties – has anything changed? Hepatogastroenterology, *45*, 2228–2233.
2. Skok, P. (1998) Does endoscopic hemostasis effect the reduction of mortality in patients with hemorrhage from the digestive tract? Hepatogastroenterology, *45*, 123–127.
3. Zuccaro, G. (1998) Management of the adult patient with acute lower gastrointestinal bleeding. Am. J. Gastroenterol., *93*, 1202–1208.

COMPARISON OF BIOLOGICAL TRANSFORMATIONS OF 2,6,9-TRISUBSTITUTED PURINE-DERIVED SYNTHETIC CYCLIN-DEPENDENT KINASE INHIBITORS BOHEMINE AND DERIVATIVE A239R

Kateřina Michalíková, Lucie Michnová

Department of Pathophysiology, Faculty of Medicine, Palacký University, 775 20 Olomouc, Czech Republic

BACKGROUND

Olomoucine type inhibitors of cyclin-dependent kinases have been implicated as potential therapeutic agents.

THE AIM OF THE WORK

The aim of this study was to compare metabolism of inhibitor bohemine and new derivative A239R in mice tissues *in vivo* and *in vitro*. The focus was made on the examination of a potential steric hindrance effect of a substituent introduced into the vicinity of the primary OH-group, which both the substances have in common.

MATERIAL AND METHODS

^{3}H-labelled compounds bohemine and A239R were used throughout the experiments. In *in vivo* experiments, the compounds were injected intravenously. The *in vitro* models included (A) Precision-cut liver and kidney slices; (B) Kidney and liver subcellular fractions (microsomes and cytosol); (C) Artificial enzyme systems (alcohol dehydrogenases, glycosyltransferases, glycosidases). Scintillation analysis, thin layer chromatography and autoradiography with subsequent densitometry were used to evaluate the data. The metabolites were identified by means of MS and enzymatic analyses.

RESULTS

Both compounds were rapidly eliminated from the mouse body in *in vivo* experiments. Liver and kidney were the main organs ensuring their clearance. In *in vitro* experiments, the compounds were dealkylated by NADPH-dependent microsomal systems, oxidised by alcohol dehydrogenases, and conjugated with glycosides. The differences between metabolism of bohemine and A239R were shown to be partly caused by different reactivity of their primary hydroxyl groups.

CONCLUSIONS

The data may facilitate the design of new cyclin-dependent kinase inhibitors of practical importance.

ACKNOWLEDGEMENT

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EVOLUTION OF BONE DENSITOMETRY AND SPECIFIC MARKERS OF BONE METABOLISM IN PATIENTS WITH MULTIPLE MYELOMA

Vít Procházka[a], Jaroslav Bačovský[b], Vlastimil Ščudla[b]

[a] *Faculty of Medicine, Palacký University, 775 20 Olomouc*
[b] *III[rd] Internal Clinic, Faculty of Medicine, Palacký University, 775 20 Olomouc, Czech Republic*

Key words: Multiple myeloma / ICTP / DEXA / Osteoresorption

INTRODUCTION

Multiple myeloma (MM) is characterised by a neoplastic proliferation of single clone of plasma cells and the production of a specific monoclonal immunoglobulin. Common features of this disease are osteoresorption and patological fractures, which cause higher morbidity and mortality. Bone density can be evaluated by DEXA in lumbal spine (L_2–L_4) region, which is commonly involved in myeloma.
The intensity of bone resorption in multiple myeloma is evaluated by examination of specific markers of osteoresorption (ICTP)[2].

METHODS

We studied group of 33 patients (19 males, 14 females, age median 61.6 years) with MM staged I.–III. (Durie-Salmon) for 1–3 years. The group was sudivided into part A (densitometry evaluated in point of diagnosis) and B (densitometry after one or two years). 25 patients were treated by conventional chemotherapy (M2 and Cy-VAD protocol) with p.o.clodronat (1600 mg a day). 8 patients received high dose chemotherapy (HDCh) supported by autologous blood stem cells transplantantation (PBSCT).
Lumbal spine (L_2–L_4) bone mineral density (BMD) and the whole bodye BMD were evaluated by dual-energy X-ray absorptiometry (DEXA, LUNAR-DPX-L). Results were expressed as T and Z score and as percentage of healthy population's BMD. The intensity of osteoresorption was measured by serum C-terminal telopeptide of type I collagen (ICTP). Synthesis of bone matrix was reflected by serum C-terminal propeptide of type I procollagen (PICP). Normal range of serum ICTP is 1.8–5.0 ng/

ml, PICP 50–170 ng/ml (female) and 38–200 ng/ml (male). Serum $ß_2$-microglobulin (beta-2m) is a marker of the tumor mass and is also an independent prognostic factor. Normal serum level reach maximally 2.4 ng/ml. Serum markers were evaluated by RIA method (Orion diagnostica, Finland).

RESULTS

During the observation period lumbal spine (L_2–L_4) BMD was slowly increasing on the average 3% a year. Z-score was significantly increasing (0.0147±0.032/month) in all patients. In a group of patients treated by HDCh and PBSCT lumbal spine BMD was rising from average 80.63% to 85.38%. The whole body BMD was without any significant change. BMD does not correlate with serum ICTP, PICP or beta-2m. Average serum ICTP level was in a group A 6.7±2.6 mg/l (range 3.6–13 mg/l), in a group B 7.0±3.5 mg/l (range 3–16 mg/l). Initial serum ICTP was increased in 20 (60%) of patients. Sex of the patients had no impact on the ICTP level. Serum PICP levels were mostly in the normal range. Only two patients had higher value of PICP. Serum beta-2m correlates (r 0.689; p 0.003) with ICTP level in group.

CONCLUSION

DEXA is a useful method for monitoring of the demineralization process in multiple myeloma. It may identify subjects with an increased risk of pathological fractures for more intensive chemotherapeutic and anti-resorptive treatment[1]. Increasing lumbal spine BMD is caused by reduction of tumor mass and by anti-resorptive treatment (p.o. clodronat). Serum ICTP changes faster than BMD. It may signal a relaps of the disease. Higher level of ICTP seems to be a negative prognostic factor[2]. Increasing of ICTP is connected with increasing of beta-2m.

REFERENCES

1. Abildgaard, N., Brixen, K., Kristensen, J.E. et al. (1996) Assesment of bone involvement in patients with multiple myeloma using bone densitometry. Eur. J. Haematology, *57*, 370–376.
2. Abildgaard, N., Bentzen, S. M., Nielsen, J. L. et al. (1997) Serum markers of bone metabolism in multiple myeloma: prognostic value of the carboxy-terminal telopeptide of type I collagen (ICTP). Br. J. Haematology, *96*, 103–110.

THE CORRELATION BETWEEN ECG CURVE AND CORONAROGRAPHY FINDING IN PATIENTS WITH CHRONIC LEFT ANTERIOR DESCENDING ARTERY OCCLUSION

Dalibor Stoszek[a], Marcela Škvařilová[b], Jan Lukl[b]

[a] *Faculty of Medicine, Palacký University, 775 20 Olomouc*
[b] *1st Internal Clinic, Teaching Hospital Olomouc, Czech Republic*

Key words: LAD / Occlusion / ECG / Coronarography

INTRODUCTION

Left anterior descending (LAD) coronary artery is a branch of left coronary artery which supplies blood to myocard of anterior wall, septum and apex. LAD artery is the most oftenly affected coronary artery by the coronary artery disease. Due to its consequence is also called a "widow maker" lesion in a literature. A total closure of this artery should lead to an anterior wall myocardial infarction (MI), its current ECG definition is a Q wave or QS wave > 0.03 second in leads V1 to V3, with or without involvement of lead V4[1]. Almost 40% of myocardial infarctions are anterior wall myocardial infarctions caused particular by occlusion of this artery. Also total occlusion of coronary artery angioplasty is difficult and is in relation with higher proportion of restenosis (43–77%)[2].

AIM

To assess if it is possible to determine the chronic LAD occlusion on the basis of ECG tracing.

METHODS

We evaluated retrospectively findings of 100 randomly selected patients with total occlusion of LAD detected by means of elective coronarography. The age median of patients was 62 years. Eighty-two per cent of patients were males, 12% of patients suffered from diabetes mellitus. We assessed the rhytm, presence of pathologic Q wave or QS complex in precordial leads, presence and size of rS complex in precordial leads and disorders in conductory system of the heart. "r" wave L 5 mm and "S" wave 3 5 mm. Chi-square and independent samples tests were used to evaluate the data.

RESULTS

Seventy-seven per cent of patients underwent clinical myocardial infarction. There was no relationship between silent myocardial infarction and diabetes mellitus. There was 75% of closures in the proximal part of artery and the collateral circulation in 60% of elective coronarography findings. No relationship between the localization of LAD closure or degree of collateral circulation and ECG finding was found. We found out the pathologic Q or QS complex in at least two leads to be present in 28% of patients, in one lead only in 20%, rS complex in at least two leads in 34%, LBBB in 8%, RBBB in 4%, RBBB + LAH in 2%, LAH in 6% and atrial fibrilation in 4%. Fourteen per cent of patients underwent ventricular tachycardia or ventricular fibrilation as a result of acute myocardial infarction. Seven per cent of ECG tracings displayed none of signs under observation. Analysing rS complexes in V1–4 leads and in comparison with control group of 50 patients with negative coronarography finding of all coronary arteries we came to a conclusion that in the positive patients group there was a r/S waves ratio significantly lower in all four leads under observation (p = 0.027, 0.003, 0.008, 0.0002 for leads V1–V4 respectively). Lead V3 appeared to be the most contributing, because there was R wave significantly higher (p = 0.001) and S wave significantly lower (p = 0.036) in negative patients.

CONCLUSION

Although there is a high correlation between LAD occlusion and ECG curve in case of acute myocardial infarction, in chronic closure we do not dispose of unambigous, highly sensitive criterium. Pathologic Q wave or QS complex specificity in LAD occlusion is almost 100%, however, sensitivity is 48% only. Also rS complex sensitivity in at least two leads is low. It is not possible to determine the chronic LAD occlusion on the basis of ECG tracing.

REFERENCES

1. Shalev, Y., Fogelman, R., Oettinger, M., Caspi, A. (1995) Does the electro-cardiographic pattern of "anteroseptal" myocardial infarction correlate with the anatomic location of myocardial injury? Am. J. Cardiol., *75*, 763–766.
2. Belli, G., Ellis, G., Topol, E. J. (1997) Stenting for ischemic heart disease. Progr. Cardiovasc. Dis., *40*, 159 –182.
3. Rozsíval, V. (1999) Intervenční katetrizace věnčitých tepen. Maxdorf, 29–42.

CORELLATION BETWEEN NERVUS AXILLARIS PARESIS IN RELATION TO RECURRENT SHOULDER JOINT LUXATIONS

Rudolf Uhlář[a], Ivana Bajdová[b], Rudolf Ditmar[b]

[a] *Faculty of Medicine, Palacký University, 77520 Olomouc, Czech Republic*
[b] *Department of Orthopedics, Teaching Hospital, 77520 Olomouc, Czech Republic*

Key words: Shoulder join / Luxation / N. axillaris / M deltoideus

We observed a set of 88 patients who were operated on recurrent luxation of shoulder joint at our clinic during 1998–1999. We examined if there was a statistically significant relation between recurrent luxations of shoulder joint and n. axillaris inervation disorders. We did not find out any statistically significant relation between the number of recurrent luxations and n. axillaria disorders.

INTRODUCTION

About 50 per cent of all luxations are luxations of shoulder joint. Static and dynamic stabilizers of shoulder joint are important for the joint function. Statistical stabilizers include congruences: the shape of the head and pit, labrum glenoidale, joint capsule and ligamenta. Dynamic stabilizers include rotation cuff muscles (m.supraspinatus, m.infraspinatus, m. subscapularis a m.teres minor), m. deltoideus , long tendon m. bicipitis brachii and long tendon m. tricipitis brachii[1].

In clinical practice we distinguish among three cardinal types of shoulder joint luxations.

LUXATIO ANTERIOR (80%) – humeral head moves to the front
LUXATIO INFERIOR (15%) – humeral head moves down
LUXATIO POSTERIOR (5%) – humeral head moves to the back

Recurrent luxations appear as a result of congenital causes (inborn joint defects, Ehler/Danlose syndrom) or acquired causes – mostly in a post-traumatic way.

Apart from the anamnesis and clinical examination, in the course of the luxation diagnosis X-ray photography is taken before and after reposition. This examination reveals potential alternative injuries (fractures, tuberculum maius and minus abruptions). Shoulder joint luxations or collum chirurgicum fractures may be accompanied by n. axillaris damages. N. axillaris separates from fasciculus posterior of plexus brachialis. It innervates m. deltoideus, m. teres minor motorically, and complexion in the region of external part of shoulder and arm sensitively. The spot of injury locates usually at the internal axilar scapula edge close to the division from fasciculus posterior.It is clinically manifested by a sensitive inertia of the above-mentioned complexion region and motorical disorder of m. deltoideus and m. teres minor.

Arm abductions over 90 % is restrained, external rotation is reduced and it leads to an atrophy of m. deltoideus and m. teres minor. Diagnosis may be made more accurate by an elektromyography (EMG) examination of the contract curve measurement method, by which the gradual inclusion of motor units m. deltoideus is measured.

PATIENTS AND METHODS

The set consisted of 88 patients who were operated on recurrent luxations of shoulder joint. 64 patients (72 %) were male and 24 patients (27.3 %) were female. The minimal number of luxations in one patient is two, the worst case were 56 luxations in one patient. 8.8 per cent of patients suffered simultaneously from disorder of n. axillaris function objectivized by EMG examination. According to relevancy these cases are classified as a complete, partial and discrete lesion of n. axillaris[2]. We observed if there was a statistically significant relation between the number of luxations and n. axillaris disorders. Data analysis was taken with an aid of the Chi-quadrate test. The youngest operated patient was 17 and oldest was 62. In patiens with no desorder we did not measure EMG, as their movability was preserved in full scall.

RESULTS

Patients distribution according to the frequency of luxations coupled with n. axillaris disorder and without its disorder.

Number of luxations	2–5	6–10	11 and more
Disorder	4	4	2
No disorder	53	16	19

p = 0.25

Distribution of the patients who suffered luxations disregarding n. axillaris disorder, according to their age and sex.

Age	<29	30-39	>40
MALE	42	14	8
FEMALE	8	8	8

p = 0.016

CONCLUSION

Surprisingly, no relation between the number of recurrent luxations and n. axillaris has been detected. Although we worked with a small number of patients, the percentage of n. axillaris disorder agreed with referential literature (5–30 per cent). Also the frequency of shoulder joints luxation, in relation to n. axillaris disorder is compliant with the results obtained by renowned institutions[3].

REFERENCES

1. Bartoníček, J., Doskočil, M., Heřt, J., Sosna, A. (1991) Chirurgická anatomie velkých končetinových kloubů, Avicenum, 88–93.
2. Urbánek, K. (1997) Skriptum speciální neurologie, Vydavatelství university Palackého, 34.
3. Kroner, K., Lind,T., Jensen, J. (1989) The epidemiology of shoulde dislocation. Arch.Orthop. Trauma. Surg., *108* (5), 288–90.
4. Müller, M. (1997) Chirurgie pro studium a praxi, Goldstein & Goldstein, 317–319.
5. Samardžič, M., Rasulič, L., Grujičič, D., Miličič, B., (2000) Results OF Nerve Transfers to the Muskulocutaneous and Axillary nerves. Neurosurgery *46,* 93.
6. Vojtaššák, J., (1998) Ortopédia, Litera medica, 476–780.
7. National Institute of Arhritis and Musculoskeletal and Skin Diseases, Questions and Answers About Shoulder Problems. Bethesda, Maryland: Autor. Retrieved March 31, 2000 from the World Wide Web: http://www.nih.gov/niams/.

THE EFFECTIVENESS OF COGNITIVE-BEHAVIOURAL THERAPY IN DEPRESSIVE DISORDERS TREATMENT

Iveta Zedková[a], Michal Kryl[b], Jarmila Gabryšová[b]

[a] *Faculty of Medicine, Palacký University, 775 20 Olomouc*
[b] *Clinic of Psychiatry, Teaching Hospital Olomouc, Czech Republic*

Key words: Depression / Psychotherapy / CBT / HAMD

INTRODUCTION

In 1995, an integrated programme for clients meeting ICD 10 criteria for some of the depressive disorders was introduced at the open Ward 32C of the Clinic of Psychiatry in Olomouc. The programme is based on the combination of psychopharmacotherapy and cognitive-behavioural psychotherapy which – according to experience and compared to other psychotherapeutic approaches – seems to be the most suitable way of depressive disorders treatment.

OBJECTIVE

To find out whether the complex treatment of depressive disorders in the particular setting of the open Ward 32C is significantly more effective (in the sense of reduction of depressive symptoms) than the standard in patient psychopharmacotherapy. As the effectiveness of purely pharmacological treatment has been proved we expect substantial improvement of depressive symptoms in both groups of patients.

METHODS

The test group consisted of 22 patients, of these 16 were females and 6 were males. The patients, hospitalized at Ward 32C of the Clinic of Psychiatry in Olomouc, presented with a depressive phase (the ICD 10 code F32.0, F32.1, F32.2). In the control group, there were 24 (19 females and 5 males) depressive-phase psychiatric outpatients not in the care of psychologists. In both groups, following basic criteria were set: age over 18 years, normal intelligence and the entry HAMD (Hamilton Rating Scale for Depression) values of 16–30 points. The improvement rate is assessed within 6 weeks of treatment clinically with the help of HAMD and BDI (Beck Depression Inventory).

RESULTS

In both groups, significant differences in comparison with the initial state were found ($p<0.001$). Thus, the depression level decreases in both observed groups. Also, the depressive symptoms reduction in the group of in-patients is markedly higher if the HAMD scale is used ($p<0.01$). However, the use of BDI self-evaluation questionnaires shows statistically significant improvement in the outpatient group ($p<0.05$), possibly due to the anticipating anxiety in hospitalized patients before the discharge. Because of the cognitive character of the psychotherapy this is only a short-term problem.

CONCLUSION

With respect to the HAMD scale results, the combined therapy of depressive disorders under the given conditions appears to be significantly more effective than the pharmacological treatment.