

# 老年脑功能的研究

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神经细胞的衰老对人体功能和适应能力影响很大,并在人体衰老过程中起主导作用<sup>(1)</sup>。所以,对老年脑功能的研究在老年医学中具有重要意义。

我们测定 60 岁以上健康老人 53 例的脑功能,其中包括视力、听力、短时图象记忆、锥体外系统运动机能—手震颤等,并与 60 岁以下各年龄组正常健康人 121 例对照。本文试图探讨老年人脑功能的变化特点。

## 方 法

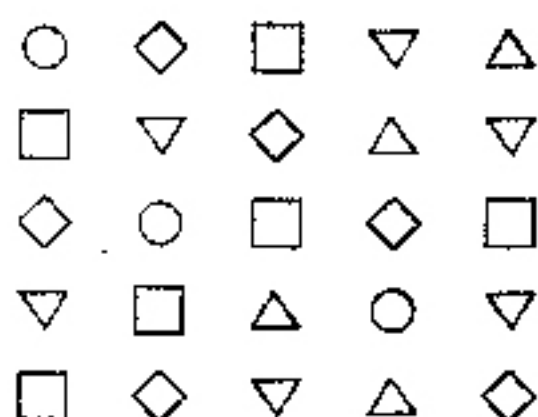
视力测定是在充分照明下(40 瓦白炽灯或日光灯)、裸眼(近视者须戴近视镜)、近距离观察视力表,并记录能看到的视力表行数。两眼分别记录。

听力测定是用 500~600 赫兹低频音叉,观察被测人左右耳分别能听到声音的距离(cm)。

短时图象记忆是被测人在短时(0.5 分钟内)看准 5 个图形内划上规定的标志(如图),划对一个得 1 分,25 个图形划对时总分为 25 分。

五个图形及规定的标志:  $\diamond$   $\ominus$   $\triangle$   $\nabla$   $\square$

另外 25 个图形:



用干电池组装的手震颤检查盒检查被测人有无手震颤及程度。方法为手震颤盒上的铜板共有两排孔,每排共 8 个孔,大孔直径 3 mm,小孔直径 2 mm,被测人用铜针向孔内插入,插入而不碰孔壁者,盒上指示灯不亮即得分,插到铜板上或插入而碰孔壁者则灯亮,为不得分。每插准一个大孔得 0.5 分,插准一个小孔得 1 分。1 分钟内插完,每孔只限插一次,左右两手全满分为 24 分。

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## 结果与讨论

一、双耳听力检查共 174 人,其中 10~49 岁组共 106 人,双耳听距离 20cm 者 75 人,占 70.75%,听距离 10cm 以下者 2 人,占 1.89%,平均听距离 18.42cm。50 岁组 15 人,双耳听距离 20cm 者 5 人,占 33.33%,平均听距离 13.87cm。60 岁以上组 53 人,双耳听距离 20cm 者 8 人,占 15.09%,听距离 10cm 以下者 45 人,占 84.91%,平均听距离 11.74cm。经统计学处理,发现双耳平均听距离随年龄增高而降低。老年人听力与年龄呈负相关, $r$  为  $-0.704$ 。

老人听力减退主要与听通路,特别是与丘脑退行性变有关<sup>(2)</sup>。

二、图形记忆检查共 160 人,其中 50 岁以下者 93 人,记忆得满分(25 分)者 54 人,占 58.06%,记忆  $<10$  分者 1 人,占 1.08%。平均记忆得分为 21.94 分。50~59 岁分组共 16 人,记忆得满分者 3 人,占 18.75%,平均记忆得分 13.75 分。60 岁以上组共 51 人,记忆得满分者 10 人,占 19.61%,平均得分 10.98 分。经统计处理,发现图形记忆得分与年龄呈负相关关系, $r$  为  $-0.84$ 。年龄越大,记忆力越差。

现认为短时记忆力本质上是在脑干网状结构和大脑感觉皮质上发生的电信号转化过程,很易受外界电活动的干扰而保持不长久<sup>(3)</sup>。

短时图形记忆主要与右侧海马有关,酒精中毒的人最损伤短时记忆力,老人海马退变时短时记忆力减退<sup>(3)</sup>,老人胆碱能神经通路障碍也会减弱短时记忆力<sup>(6)</sup>。

三、手震颤检查共 131 人,其中 50 岁以下共 72 人,经插孔试验无手颤得满分(24 分)者 42 人,占 58.33%,12 分以下者 1 人,占 1.39%。平均得分 21.78 分。50~59 岁 8 人,无手颤者 2 人,占 25%,平均得分为 16.5 分。60 岁以上者 51 人,无得满分者,平均得分为 8.12 分。经分析,证明手颤得分与年龄增长呈负相关关系, $r$  为  $-0.68$ 。年龄越大,手颤越严重,插孔失败次数越多,得分越少。

手震颤的发生,其程度与年龄有关。老年人年龄越高,手颤发生率越高,程度亦越重。手震颤产生与调节随意运动的锥体外系统和小脑功能有关。供给纹

状体苍白球系统血液的豆纹状动脉在脑内最为细长，动脉硬化时首先波及，老人如伴有豆纹状动脉硬化，小脑浦氏细胞随年龄增长而进行性减少<sup>(4)</sup>。研究还发现，老年时中枢内胆碱能神经通路与多巴胺能神经通路都有退行性变化<sup>(5)</sup>，而这两个化学通路都参与锥体外功能<sup>(5,6)</sup>。

四、双眼近视力检查共104人，其中50岁以下70人，最高视力5.2者6人，占8.57%，近视力为4.4以下者只1人，占1.43%。平均近视力为5.0。50~59岁组9人，平均近视力为4.6。60岁以上共25人，平均近视力为4.3。经直线相关分析，得 $r$ 为-0.81。发现两眼近视力与年龄呈负相关关系。年龄越大，两眼近视力越差。

老年近视力差的原因主要是由于晶状体囊的弹性进行性变小或晶状体蛋白质的进行性营养不良，另一方面也与睫状肌收缩力的逐渐减退有关，老年视力的减退除上述晶状体调节力减弱的原因外，也可能与视通路、特别是丘脑退行性变化有关<sup>(2)</sup>，后者视力可反映脑功能。

上述研究结果将对老年脑功能研究提供简易可靠的方法和数据，为防衰老措施提供依据。无论视力、听力、短时图象记忆、锥体外系统运动机能—手震颤等明显降低皆在50岁后，提示防老应特别注意保护50岁年龄的脑功能，更有利于延缓衰老。祖国医学早在内经中就有关于脑髓研究的记载，如《素问·六节脏象论》云：“肾者，……精之处也，其充在骨。”《素问·五脏生成篇》：“诸髓者皆属于脑。”又《素问·逆调论》云：“肾不生，则髓不能满。”说明肾生髓灌骨而充

脑。由此可知中医肾和脑髓关系密切。初生儿肾气不充盛，故脑髓不足，目不灵，耳不知听，其智力亦弱；而老年人，肾气衰，脑髓不足，记忆力减弱。因髓为肾所生，精盛则髓足，髓足则智力强，故凡脑髓不足的病证，治疗时皆宜补肾为主，对防治老年病提供依据。

## 小 结

本文测定不同年龄组的视力、听力、短时图象记忆和锥体外系统机能的实验中发现，这些机能50岁时即明显降低，60岁以上老人的视力、听力、短时图象记忆和锥体外系统机能（手震颤发生率）与年龄增加呈负相关。

上述结果提示，保护老人脑功能应从50岁即开始。老人多肾气衰，脑功能不足，所以保护脑功能应以补肾为主。

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# 复方大蒜软膏治疗早期急性肾衰的临床观察(摘要)

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**药物制备** 处方：大蒜油 4.8ml 大黄 300g 芒硝 600g 麝香 0.03g 甘油 200g 二甲亚砜 60ml 羧甲基纤维素 70g 蒸馏水 800ml。

**配制：**(1)羧甲基纤维素、二甲亚砜、甘油混合研匀；(2)芒硝加蒸馏水加热溶解，过滤后加入(1)中搅匀；(3)加入大黄(细粉)搅匀；(4)加入大蒜油与麝香(先用适量乙醇研匀)混合搅匀。即制成复方大蒜软膏(简称软膏)。

**用法** 软膏 50~70g 2份，分敷于双侧肾区(以确保复盖肾脏为宜)，1~2次/日，6小时/次，4~7天为一疗程。皮肤过敏者，可在软膏与皮肤间垫一层凡士林纱布。

**临床效果** 我院于1980年7月~1981年12月用软膏外敷双侧肾区治疗急性肾功能衰竭20例(除有休克症状外，并有肾功能损害，血中非蛋白氮、肌酐、尿素氮升高和二氧化碳结合力降低，尿量少于400ml/日)，治疗效果较好的15例，较差的2例，无效3例，有效率达75%。

软膏的利尿作用明显，敷药1.5小时后尿量明显增加，每次排尿150ml以上，用药期间尿量1,200~2,500ml/日。本软膏能促进肾功能改善，对尿路感染似也有控制作用；软膏制取简单，使用方便，有一定推广价值。

## **X-Ray Research of Gastro-Entero-Functional Examination for the Deficiency Syndrome of Chronic Bronchitis**

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This paper reports results from GI examination of the barium meal in 123 cases of chronic bronchitis and 20 cases of healthy subjects as control. The results obtained have shown that abnormality in the GI tract for the patients with Qi deficiency in the lung is insignificant. However, patients with Yang deficiency in the spleen and kidney have quite a few varied abnormal phenomena: retention of moderate quantity of gastric juice in the empty stomach; folds of the gastric membrane being thickened; gastric hypotension; decrease in speed, number and frequency of the gastric peristalsis wave; and prolongation of empty period in the stomach and the intestine. However, colon's motor function is increased. This may explain pathologically why patients with Yang deficiency in the spleen and kidney appear to possess symptoms typical of the digestive system. (Original article on page 225)

## **Observations on Cerebral Functions in the Aged**

Chen Kezhong ( 陈克忠 ), et al

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This paper tries to provide simple methods and parameters for the prevention of aging. We have tested nearsighted visions, auditory function, transient memory of various shapes of drawings and function of extrapyramidal system (tremor of hands) in 53 healthy persons aged over 60. 121 healthy persons below 60 were grouped according to their age scale as controls. Our study has indicated that the functions mentioned above decreased markedly over 50 years of age. In those over 60, they had a negative correlation with the increase of age. These results suggest that the prevention of the regression of cerebral functions should be started at the age of 50. Because of the waning of the kidney in most of the aged, which is the main cause of regression of the cerebral functions, it is reasonable to replenish vital energy or essence of the kidney for the prevention of regression of the cerebral functions. (Original article on page 227)

## **Analysis of Blood Flow Dynamics of Taut Pulse and Slippery Pulse**

Chen Dekui ( 陈德奎 ), et al

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Examination of the radial pulse has been one of the important items of clinical diagnosis in TCM. The physiological and pathological implications of the radial pulse have not been fully studied until recent years. We have reported the establishment of a mathematical model according to non-linear elastic chamber hypothesis and derivation of the relative equations for the stroke volume of the heart (SV), the total peripheral resistance (TPR) and arterial compliance (Co) from the pulse wave form by using strain gauge method and impedance rheogram.

In this clinical study, 28 normal pulse, 32 slippery pulse of pregnancy, and 47 taut pulse of hypertension were investigated. A comparison between slippery pulse was classified according to hardness into three grades, namely 1, 2 and 3 respectively. It was found that the predicrotic pulse wave of the taut pulse ascended with increasing hardness, whereas in the case of slippery pulse, the predicrotic pulse descended. The higher the taut pulse, the greater the increase of TPR, arterial elastic modulus and the decrease of the stroke volume. This turned out opposite in the case of slippery pulse.

Animal experiment in dogs has demonstrated that infusion of nor-epinephrine, a vasoconstricting agent, induced a pulse pattern similar to taut pulse, while *viscum coloratum*, a vasodilating agent, induced a pulse pattern similar to slippery pulse. (Original article on page 232)

## **A Preliminary Study of Internal Heat Due to Deficiency of Yin — The Sodium Inhibitory Action of Anemarrhena Rhizome in Vivo**

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It was mentioned in our previous report that a kind of saponin from *Anemarrhena Rhizome* had been isolated. The saponin and its hydrolytic product, sapogenin, are potential inhibitors of sodium pump in vitro. In this paper, the sodium pump inhibitory action of the sapogenin in vivo is reported. Eighteen rats were divided into three groups—control, thyroxine group and thyroxine plus sapogenin group. The duration of drug administration was three weeks. Then the animals were killed and the sodium pump activity of four organs (liver, kidney, the mucous membrane of the small intestine and brain) were measured. The results revealed that the activity of the three organs (liver, kidney and the mucous membrane of the small intestine) were markedly induced by the thyroxine and the induced enzyme can be inhibited totally by the sapogenin in vivo. Significances of the result are discussed.

(Original article on page 235)