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## 封面文章

青光眼是全球首要的不可逆致盲性眼病,严重影响患者的生活质量。原发性开角型青光眼(primary open angle glaucoma, POAG)是最常见的青光眼类型,且发病率随着年龄增大而明显增高,随着我国人口老龄化的加剧,POAG发病人数逐年增加。正常眼压性青光眼(normal tension glaucoma, NTG)是一种特殊类型的原发性开角型青光眼,眼压不高、发病隐匿,多数患者确诊时已达中晚期,视力损伤严重,且由于发病机制不明而造成治疗效果不理想。因此,深入研究NTG的神经损伤机制将为提升其诊疗水平和探索新的治疗方案提供重要依据。

研究表明,POAG是一种累及多个脑区的神经退行性疾病,表现为大脑广泛的结构和功能异常,但由于部分POAG患者眼压增高,眼压因素和非眼压因素与脑改变的关系难以确定,而NTG患者眼压正常,可避免眼压因素的影响,为进一步阐明非眼压因素引起的POAG神经退行性改变的机制提供了研究机会与平台。

近年来,脑磁共振研究发现NTG患者的神经元损伤不仅局限于视觉通路,而且累及视觉通路以外的多个脑区,但其损伤特点与机制及其与视野缺损之间的关系尚不清楚。

本研究采用扩散峰度成像(diffusion kurtosis imaging, DKI)比较和分析NTG患者与健康志愿者的大脑皮质44个脑区的各向异性分数(fractional anisotropy, FA)、平均峰度(mean kurtosis, MK)、辐射峰度(radial kurtosis, RK)及轴向峰度(axial kurtosis, AK)的差异及其与视野缺损的相关性。结果显示NTG患者视觉皮层、突显网络相关皮层、默认网络相关皮层、背侧注意网络相关皮层、颞顶枕连接区、初级听皮层及眶回及额极存在广泛的微结构损伤,FA值可反映脑微结构损伤与患者疾病严重程度的关系,是潜在的生物学指标。详见内文第6页。

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## 2022年全国体部影像诊断新进展及临床应用学习班成功举办

2022年6月5日,为期近3天的全国体部影像诊断新进展及临床应用学习班顺利结束!此次公益性学习班由国家老年医学中心、北京医院放射科联合《磁共振成像》杂志社举办,课程以线上授课形式进行。

随着影像技术的飞速发展和专业细化,我国影像诊断水平快速提高,除了传统的形态学影像信息之外,现代影像技术还可提供血流、代谢等功能信息,已然成为医疗工作的重要支柱。然而,由于影像技术发展日新月异,诊断方法层出不穷,如何选择最有效的诊断方法和先进的诊断思路成为临床关注的重点问题。因此,本次课程以服务基层、传授先进的影像学技术及诊断经验、推动基层医疗技术改进为目的,突出专业领域进展和临床应用。授课团队以北京医院放射科骨干为基础,邀请外院影像诊断丰富经验的著名专家学者与会授课,涉及腹盆、心胸及神经等多系统,设立多个专题,全方位、多层次地展示影像诊断的发展现状及未来方向,推动本学科的发展和建设。

开幕式上,中国医师协会放射医师分会会长、《磁共振成像》主编、北京协和医院金征宇教授,中国医学科学院肿瘤医院周纯武教授,以及中华医学会放射学分会候任主任委员、北京医学会放射学分会主任委员、北京医院放射科主任陈敏教授分别致词。他们希望通过本次培训班,使得听众能够有所收获,了解最新的影像技术和知识,达到提高诊疗水平的目的。

本次学习班安排32节课,内容丰富实用。本次学习班邀请到了首都医科大学宣武医院副院长卢洁教授、中国医学科学院肿瘤医院赵心明教授、首都医科大学附属北京同仁医院鲜军舫教授、北京大学第三医院放射科主任袁慧书教授、解放军总医院第一医学中心马林教授、北京协和医院薛华丹教授、兰州大学第二医院周俊林教授、首都医科大学附属北京妇产医院梁宇霆教授、中南大学湘雅医院廖伟华教授、首都医科大学三博脑科医院朱明旺教授、首都医科大学附属北京友谊医院靳二虎教授、中国医学科学院肿瘤医院欧阳汉教授、首都医科大学附属北京朝阳医院蒋涛教授、《磁共振成像》杂志社贺光军社长,以及北京医院陈起航主任医师、李惠章主任医师、陈涓主任医师、李飒英主任医师、姜蕾主任医师、王蕊主任医师、宋焱主任医师、李春媚主任医师、张旻副主任医师、谷涛副主任医师、叶晓华副主任医师、朱捷副主任医师、郭镡副主任医师、黄娟副主任医师、王向阳医师、罗晓捷医师等多位专家进行专题报告,同时还有多位青年医师进行了精彩的病例分享。

北京医院放射科副主任陈涓教授致闭幕词。本次学习班从日常工作出发,理论联系实际,大家通过线上形式的交流,将影像与临床完美结合,实现了多学科沟通。希望通过这种学习班的形式,使得全国各地的影像医师都能紧跟时代步伐,及时更新知识并提高诊疗水平、了解最新技术,更好地投入到医疗工作中,为更多患者带去优质的医疗服务。

本次学习班正式注册学员2456人,受到了业界同行好评。学员们纷纷表示获益匪浅,并期待下一期学习班的精彩内容。

(供稿:曹若瑶,陈涓)

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#### About the cover

Glaucoma is the leading cause of global irreversible blindness, which seriously affects the quality of life of patients. Primary open angle glaucoma (POAG) is the most common form of glaucoma. The morbidity increases significantly with age. With the aggravation of population aging in China, the number of patients with POAG increases year by year. Normal tension glaucoma (NTG) is a special form of POAG, with low intraocular pressure and concealed onset. When diagnosed, most patients are in the middle or late stages with severe visual impairment. Due to the unknown pathogenesis, the ophthalmic treatment effect is not satisfying. Thus, further study on the neural injury mechanism of NTG will provide important evidence for not only improving diagnosis and treatment level, but also exploring new treatment schemes.

Research shows that POAG is a neurodegenerative disease involving multiple brain regions, which is characterized by extensive structural and functional abnormalities of the brain. However, due to the elevated intraocular pressure in some POAG patients, it is difficult to determine the relationship between intraocular pressure and non-intraocular pressure factors and brain alterations. As the normal intraocular pressure in NTG patients can avoid the influence of intraocular pressure, NTG provides a research opportunity and platform for further exploring the mechanism of POAG neurodegenerative changes caused by non-intraocular pressure factors.

In recent years, brain magnetic resonance studies have found that the neuronal injuries in NTG patients is not only limited to the visual pathway, but also involves several brain regions outside the visual pathway. However, the characteristics and mechanisms of brain injury and the relationship between the injury and the visual defect are still unclear.

In this study, the diffusion kurtosis imaging (DKI) was used to compare the difference of fractional anisotropy (FA), mean kurtosis (MK), radial kurtosis (RK) and axial kurtosis (AK) in 44 cerebral cortex regions of NTG patients and healthy controls. The correlations between DKI parameters and mean defect of visual field of NTG patients were also analyzed. The results showed that the visual cortex, salience network, default network, dorsal attention network, temporoparietal occipital junction, early auditory cortex, orbital gyrus and frontal pole of NTG patients have extensive microstructural injuries. FA value could reflect the correlation between brain microstructure injury and disease severity, and is a potential biological indicator. Please see page 6.

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