



## $^{99m}\text{Tc}$ -MIBI 脑SPECT对脑胶质瘤的诊断价值

胶质细胞瘤是中枢神经系统最常见的原发性肿瘤之一，立体定向活检和标本采集误差往往会使肿瘤分级不准确，影响对肿瘤的完整评价、治疗和预后评估。CT、MRI对肿瘤解剖结构的显示较好，对胶质瘤的诊断效能近年有了很大提高，但对肿瘤内部组织活性的诊断不足[1][2][3][4]。本研究采用 $^{99m}\text{Tc}$ -MIBI脑SPECT对脑胶质瘤患者进行显像，以探讨其对脑胶质瘤的诊断价值。

### 1 资料和方法

#### 1.1 临床资料

脑胶质瘤患者59例，其中男37例、女22例，年龄8~69岁，平均51.5岁。III~IV级星形细胞瘤(高度恶性组)39例，包括19例多形性胶质母细胞瘤、4例间变性星形细胞瘤、5例间变性少枝胶质细胞瘤及3例低度恶变胶质细胞瘤；II级星形细胞瘤(低度恶性组)22例。所有病例均经病理检查确诊。对照组15例，6例为脑脓肿患者，其余9例为正常人。

#### 1.2 显像方法

静脉注射 $^{99m}\text{Tc}$ -MIBI 1 110 MBq，3 h后取仰卧位。TOSHIBA GCA-901A型SPECT仪配低能高分辨准直器，矩阵128×128，探头旋转360°，6°/帧，20 s/帧。重建后获得冠状面、矢状面和横断面图象。

#### 1.3 图象处理

把脑室内脉络膜以外的脑实质出现放射性定为异常放射性浓聚。选择肿瘤部位放射性浓聚最明显的断层面对肿瘤感兴趣区(ROI)。采用镜影技术，在对侧相同部位勾画相同形状和大小的区域，其放射性浓度(counts/pixel)作为本底，ROI与本底的放射性浓度比值即为病灶的T/NT比值。

#### 1.4 统计学处理

计算 $^{99m}\text{Tc}$ -MIBI脑SPECT诊断脑胶质瘤的灵敏度、特异性、准确率。脑胶质瘤组、脑脓肿组、正常组间T/NT比值的比较采用t检验，统计学软件为SPSS 8.0版。

### 2 结果

#### 2.1 影像所见

在正常组， $^{99m}\text{Tc}$ -MIBI在面部软组织尤其是腮腺、颌底、头颅、头皮等部位有浓聚；颅内中线及双侧侧脑室后角脉络丛显影清晰，且左右基本对称；脑实质内无放射性聚集。在脑胶质瘤患者，肿瘤部位有明显 $^{99m}\text{Tc}$ -MIBI聚集，表现为异常放射性浓聚影，浓聚影呈圆形、片状或条索状，且浓聚程度高。

#### 2.2 诊断效能

59例脑胶质瘤患者中，51例显像为阳性，诊断灵敏度86.4%(51/59)，呈现阴性的8例中，3例因肿瘤太小

难以显示, 2例摄取程度极低而难以确定, 其余3例病灶位于脉络丛附近而漏诊。对照组15例, 5例脑脓肿呈假阳性, 故诊断特异性为66.7%(10/15), 阳性预测值为91.1%, 阴性预测值为55.6%。

### 2.3 半定量分析

59例脑胶质瘤患者病灶部位T/NT比值为 $0.8\sim 6.6$ , 平均 $2.6\pm 1.2$ 。9例正常人组T/NT比值为 $0.8\sim 1.6$ , 平均 $1.1\pm 0.2$ 。二者之间差异显著( $t=3.6199$ ,  $P<0.001$ )。6例脑脓肿患者,  $^{99m}\text{Tc}$ -MIBI摄取指数分别为 $1.4\sim 2.9$ , 平均 $1.5\pm 0.5$ , 明显低于脑胶质瘤组( $t=2.1327$ ,  $P<0.05$ )。

## 3 讨论

正常情况下由于血脑屏障存在,  $^{99m}\text{Tc}$ -MIBI不能到达脑组织内, 只能在脑外血窦和血管中存在, 故SPECT显示脑组织呈放射性空白区, 而脉络膜等血窦可显影。当脑组织发生肿瘤, 血脑屏障遭到破坏时,  $^{99m}\text{Tc}$ -MIBI可进入病变区。由于 $^{99m}\text{Tc}$ -MIBI带正电、具亲脂性, 可被肿瘤细胞中P-糖蛋白吸附[5][6]。此外, 肿瘤细胞的膜电压与正常细胞不同, 借此可促使 $^{99m}\text{Tc}$ -MIBI摄取增加并使显像剂滞留在肿瘤细胞内而实现肿瘤阳性显像[7]。本组结果显示, 该显像对脑肿瘤有较高的探查能力, 治疗前灵敏度达86.4%, 与文献报道[8]基本一致。但由于受SPECT空间分辨率的限制, 对于较小的病灶,  $^{99m}\text{Tc}$ -MIBI脑SPECT则难以检出。由于 $^{99m}\text{Tc}$ -MIBI在脑内脉络丛有生理性摄取, 对于某些脉络丛封闭不完全的患者, 而且病灶位于脉络丛附近时, 则病灶容易被误认正常脉络丛而漏诊。本研究显示,  $^{99m}\text{Tc}$ -MIBI脑SPECT诊断的特异性为66.7%, 比文献报道[9]的低, 原因是对照组具有5例脑脓肿患者, 其病灶异常摄取, 造成假阳性。

以往研究表明,  $^{201}\text{Tl}$ 在探测脑肿瘤代谢方面具有高度特异性。 $^{99m}\text{Tc}$ -MIBI与 $^{201}\text{Tl}$ 具有许多相似之处: (1)都不能通过正常的血脑屏障; (2)都能被人体肿瘤摄取。但与 $^{201}\text{Tl}$ 比较,  $^{99m}\text{Tc}$ -MIBI具有更多优势: (1) $^{99m}\text{Tc}$ 的物理性能好; (2)物理半衰期短, 纯 $\gamma$ 射线, 病人所接受辐射剂量低, 因而可用较大活度; (3) $^{99m}\text{Tc}$ 标记的药盒随时都可获得[10]。因此,  $^{99m}\text{Tc}$ -MIBI脑SPECT探测脑肿瘤, 具有更好的临床实用价值。本研究显示, 脑胶质瘤组病灶摄取 $^{99m}\text{Tc}$ -MIBI显著高于正常人, 而且也高于脑脓肿组, 说明 $^{99m}\text{Tc}$ -MIBI脑SPECT可以较好地鉴别脑内良恶性病变。同时也说明,  $^{99m}\text{Tc}$ -MIBI被肿瘤摄取, 不仅与病灶部位的血液供应、血脑屏障的完整性有关, 而且病灶的摄取强度可能与肿瘤的恶性程度也相关, 该相关性还有待进一步研究。

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[回结果列表](#)