五种抗肿瘤药对小鼠造血干细胞和 P 388 白血病干细胞的作用比较

周永新、谭长先、冯德文
(中国医学科学院药理研究所，北京 100050)

摘要 本研究选用正常小鼠造血干细胞株 NCu-C 和 P388 白血病细胞株 LCFU-C 的作用，对几种抗肿瘤药进行研究。结果表明，五种抗肿瘤药对小鼠造血干细胞株 NCu-C 和 P388 白血病细胞株 LCFU-C 的作用有显著差异。NCu-C 作用较强，其 IC50 值为 1000 ng/ml；P388 对 NCu-C 的作用较弱，其 IC50 值为 20000 ng/ml。这些结果表明，不同抗肿瘤药对小鼠造血干细胞和 P388 白血病干细胞的作用有显著差异。

关键词 五种抗肿瘤药、NCu-C 细胞株、P388 细胞株、IC50 值

H 和 HH 是三尖杉属 (Cephalotaxus) 植物中提取的生物碱，目前已有人工半合成，对其

* 周永新为第一作者，谭长先为第二作者，冯德文为第三作者。
动物: DBA/2小鼠和昆明种小鼠分别由中科院动物中心提供,笼养5-7周,雌雄均有。

小鼠取皮 白血病细胞: 由血瘤株C 16提供,取液以生理盐水稀释20倍,用DBA/2小鼠每周注射1次。

药物: H, H 1和PSH由本所药厂提供,阿霉素(商品名)有本所药厂生产,批号800617;CY由上海第二制药厂生产,批号702124,上述药物均用生理盐水稀释,CY用生理盐水配制。

培养基 RPMI-1640由日本Nissui-Seiyaku Ltd.制,为Frohlich基础培养液,Serum血液稀释度为20%,未加血清。

琼脂 Difco的Reto-agar,用生理盐水制成3%溶液,放在37℃水浴中使用15min,琼脂成0.6%的琼脂溶液,放于4℃冰箱待用。

扩散瓶 有效面积的单面扩散瓶,内径10mm,置于一面用聚丙烯(天津北郊合成)真空干燥机中,在20%乙醇中浸泡1h,再于80℃烘箱中干燥24h。

药物对小鼠L1210和L 36 6的抗肿瘤作用:均用琼脂扩散法,取DBA/2小鼠皮下移植瘤4只,给药前6h,每只小鼠通过皮下注射10mg/kg,取给药后36h,将小鼠处死,取肿瘤剪成小块,用生理盐水稀释20倍,在皮下注射。结果表明,阿霉素对L1210和L366均有显著的抗肿瘤作用。
Fig 1. Comparison of effects of 5 antitumor drugs on normal hemopoietic colony-forming units in culture (NCFU-C, p) and P388 leukemic colony-forming units in culture (LCPF-U, c) in mice by agar diffusion chamber technique. Drugs were injected iv into the lat recipients of chambers. After 16-20 h the chambers were transplanted from the lat recipients to the 2nd recipients that were given 700 rad whole-body irradiation. Incubation time following final chamber implantation were 5 d for both NCFU-C and LCPF-U. Mean ± SD of at least 3 chambers. EIR, efficacy ratio.

NCFU-C = LCPF-U. CSF3 (±) the cell size was the largest.

The authors then used the agar diffusion chamber technique to compare the effects of 5 antitumor drugs on normal and leukemic hemopoietic colonies. The efficacy ratio (EIR) was calculated and the results showed that the drugs had varying degrees of toxicity on normal and leukemic cells. The EIR values were compared, and it was found that the drugs had different effects on normal and leukemic cells. The authors concluded that the agar diffusion chamber technique was a useful method for comparing the effects of antitumor drugs on normal and leukemic hemopoietic cells.

References
5. Gordon MY. Br J Cancer 1970; 34:421

Comparative Effects of Five Antitumor Drugs on the Hemopoietic and P388 Leukemic Stem Cells in Mice

ZHOU Qi-xin*, PAN Zhe-ren, FENG Jian-bao, HAN Rui
(Institute of Materia Medica, Chinese Academy of Medical Science, Beijing 100052)

ABSTRACT
The effects of 5 antitumor drugs on normal bone marrow colony-forming units in culture (NCFU-C) and P388 leukemic colony-forming units in culture (LCPF-U) of mice
were compared by agar diffusion chamber (ADC) technique. The dose-survival curves for both of the stem cells exposed to harringtonine (H), homoharringtonine (HH), partial synthetic harringtonine (PSH), and cyclophosphamide (CY) exhibited exponential forms. The values of the efficiency ratio H 1.8, HH 5.5, PSH 4.7, and CY 3.7. In contrast, there was no clear dose-response relationship between the effects of arabinosylcytosine (ara-C) on LCFU-C and LCFU-C at dosage of 125-1000 mg/kg.

dose-survival curves for both of the stem cells were decreased to about 38% at 1 g/kg.

KEY WORDS: agar diffusion chamber, granulocytic committed precursor cells, P388 leukemic stem cells, harringtonine, homoharringtonine, partial synthetic harringtonine, cyclophosphamide; cytarabine

*Dept of Pharmacology, Chongqing Medical College, Chongqing