DOI:10.16016/j.1000-5404.1987.01.015



# 重型乙型肝炎中δ因子感染的初步观察

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**提 要** 本文回顾性研究35例重型乙型肝炎中δ因子感染状态。选择近期病后＞20天的血清标本（每例一份）用EIA法（美Abbott试剂盒）进行抗-δ测定。结果：抗δ（＋）共12/35例（34.3%），其中亚重肝3/13例（23.1%），慢重肝9/22例（40.9%），每例都有3～5项标记HBV感染血清学指标。平均年龄34岁（19～51岁），皆为男性汉族，1例贵州籍，余均为川籍。抗δ（＋）的12例重肝患者中，3例亚重肝病情有再度加重历史；9例既往急性肝炎史，其中5例证实长期携带HBsAg。近期发病多进展迅速，推测δ感染对病情恶化可能有一定影响。

**关键词** δ因子感染；抗-δ；重型乙型肝炎

自1977年Rizzetto[1]在意大利首次发现δ因子以来，关于δ因子的研究日益广泛和深入。在欧美等国的某些地区，其发生率相当高，并发现和乙型肝炎病情恶化和慢性化有一定关系[2][3]。δ因子是一种缺陷性RNA病毒，其生存、繁殖依赖于HBV的复制[4]，故δ因子的感染和HBV关系十分密切。在HBsAg携带率较高的我国，δ因子的感染率究竟如何？尚需进一步探明。据少数地区的报告，各地感染率差异较大。为了解δ因子在四川地区的存在及其与乙型肝炎病情发展的关系，我们选择了35例重型乙型肝炎的血清标本，作了抗-δ测定。现将结果报告如下。

## 对 象

本科1984.3～1986.1间收治的重型乙型肝炎35例（亚急性重型13例，慢性重型22例，诊断标准按1984年南宁会议制定的方案，30例有组织学诊断），男性32人，女性3人；四川籍30人（包括22个县市），贵州、安徽、湖北、山东、天津各1人；皆为汉族。全部选择近期发病后病程＞20天（21～156天，平均57天）血清标本。每例患者同时检测下列各项血清学指标：

1. 抗-δ：酶联免疫法（美国Abbott Anti-Delta EIA试剂盒，操作步骤和计算方法全部按其说明书进行），于GXM-201型酶标光度计（四川分析仪器厂产）测OD值（光密度492 nm）。本实验测得阴性对照平均OD值为0.97，阳性对照OD值为0.005，按公式计算阳性值上限：

0.6×0.05（阳性对照OD值）＋0.4×0.97（阴性对照OD值）＝0.391

以血清标本之OD值≤0.391判为阳性。

2. HBsAg：反向间接血凝法（R-PHA），北京生研所试剂。

3. 抗HBc：酶联免疫吸附（ELISA）竞争抑制法，军科院基础所提供药盒。

4. 抗HBc-IgM：ELISA双抗夹心法。纯抗IgM由北京生物制品研究所提供，自行过DEAE纤维素柱。HBcAg和抗HBc由军科院提供。每份标本同时进行$10^{-3}$，$5\times10^{-3}$稀释。以P/N值≥2.1判为阳性。

5. HBeAg和抗HBe：酶联免疫吸附法，北京生研所药盒，结果按其说明书判定。

6. HBV-DNA：$^{32}$P斑点杂交自显影法，第一军医大学流行病教研室提供。

## 结 果

一、35份重型肝炎血清标本中抗-δ（＋）12份（34.3%），OD值在0.06～0.34之间，其中亚急性重型3/13例（23.1%），慢性重型9/22例（40.9%），全为汉族，男性，1例贵州籍，余皆为川籍；抗-δ（－）23份，OD值在0.46～0.96之间。（附表）

二、12例抗-δ（＋）的患者中，有3例既往无肝炎史，也无明确的HBsAg携带史，本次发病符合亚急性重型，血清HBsAg（＋），病程中有病情再度加重的历史；9例既往（10月～25年前）有患过急性黄疸型肝炎病史，5例已知既往HBsAg（＋）。本组中多数（9/12例）患者发病后病情进展迅速，入院时病程不到一个月已达重型肝炎之

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附表　12例重型肝炎血清HBV和δ因子感染情况

| 病例 | 性别 | 年龄 | 民族 | 籍贯 | *诊断 | 既往AH史 | 抗δ | HBsAg | 抗HBc | 抗HBc IgM | HBeAg | 抗HBe | HBA DNV | 转归 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.高×× | 男 | 33 | 汉 | 贵州习水 | SFH | 无 | + | 1:16卄 | + | + | − | − | + | 临愈 |
| 2.杨×× | 〃 | 28 | 〃 | 四川江北 | 〃 | 〃 | + | 1:8卄 | + | − | + | − | + | 〃 |
| 3.邓×× | 〃 | 34 | 〃 | 〃重庆 | 〃 | 〃 | + | 1:16卄 | + | + | + | − | + | 死亡 |
| 4.张×× | 〃 | 31 | 〃 | 〃合川 | CFH | 10月前 | + | 1:8卄 | + | + | + | − | + | 临愈 |
| 5.赵×× | 〃 | 27 | 〃 | 〃重庆 | 〃 | 2年前HBsAg(+) | + | 1:64卄 | + | + | − | − | + | 〃 |
| 6.陈×× | 〃 | 23 | 〃 | 〃潼南 | 〃 | 3年+HBsAg(+) | + | 1:64卄 | + | + | + | − | − | 死亡 |
| 7.苏×× | 〃 | 51 | 〃 | 〃南充 | 〃 | 6年前HBsAg(+) | + | 1:8卄 | + | + | − | + | + | 〃 |
| 8.谢×× | 〃 | 19 | 〃 | 〃万县 | 〃 | 1年前HBsAg(+) | + | 1:64卄 | + | + | − | − | − | 〃 |
| 9.胡×× | 〃 | 32 | 〃 | 〃广安 | 〃 | 5年前 | + | 1:4卄 | + | + | + | − | − | 〃 |
| 10.周×× | 〃 | 46 | 〃 | 〃南充 | 〃 | 25年前，反复3次 | + | 1:32卄 | + | + | − | − | + | 〃 |
| 11.吴×× | 〃 | 42 | 〃 | 〃合川 | 〃 | 6年前 | + | − | + | + | − | − | − | 〃 |
| 12.黎×× | 〃 | 41 | 〃 | 〃长寿 | 〃 | 8年反复3次HBsAg(+) | + | 1:8卄 | + | + | − | − | + | 〃 |

* SFH：亚急性重型肝炎；CFH：慢性重型肝炎

临床诊断标准。

三、12例抗-δ（+）的病例都可确定为HBV感染患者，每例都可检测到HBV感染指标3～5项：HBsAg（+）11例，抗-HBC全部阳性，抗-HBc-IgM（+）11例，HBeAg（+）4例，抗HBe（+）1例，HBV-DNA（+）8例，DNA-P（+）2例；抗-δ（+）重型肝炎之HBsAg滴度≤1:16++者8/12例(66.7%)，但与抗-δ(−)组16/23例（69.6%）比较，未见明显差异（P>0.05）；抗-δ（+）患者之血清胆红素、谷丙转氨酶、凝血酶元时间的平均峰值分别为17.2±4.7mg/dl，125.5±93.0u/dl和21.1±6.1秒，与抗-δ（−）组的平均峰值17.0±5.6mg/dl，76.7±62.2u/dl及22.6±5.9秒比较（P>0.05）；两组的病死率66.7%（8/12例）与60.1%（14*/23例）之间亦无差异（P>0.05）。

*含恶化出院后证实死亡之病例。

## 讨　论

一、本文35例重型乙型肝炎的患者中抗-δ（+）占12例，阳性率达34.3%（尚未包括肝组织中δ抗原可能阳性的患者），表明本组病例δ因子的感染是比较严重的，由于我们选择的检测对象是一般认为δ因子高发人群的重型肝炎，尚不能代表δ因子在四川重庆地区HBsAg携带者中的感染率，只可肯定在四川（某些县市）汉族人群中存在δ因子感染。

二、一般认为，δ因子与乙型肝炎的同时重叠感染，比单纯乙型肝炎病毒的感染病情可能要严重，易恶化而发展成重型肝炎[2][8]，也可加速慢性HBV感染者肝脏损伤的进展。本组重型肝炎中，仅抗-δ(+)就有12/35例，远远超过国内[5][7]已报告的HBsAg携带者中δ因子的感染率，与国外报告的同类患者近似[6]。分析抗-δ（+）病例的临床，3例亚重肝都有病程中病情又加重的

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历史，符合HBV和δ因子同时感染的临床[6]；其余病例既往肝炎病史多隔时较久，超过5年的有5例，有5例明确为HBsAg携带者，可能为重叠感染者。本组抗-δ（+）者本次发病后多数病情进展迅速，8例入院时病程未及一月，已达重型肝炎的临床诊断标准，因此推测大多数患者的δ因子感染对HBsAg携带者的病情发展可能有一定影响，结果支持Rizzetto[9]提出的HBsAg携带者是δ因子的主要攻击目标（和主要牺牲者）。HBsAg状态为这个缺陷因子的充分表达提供了最佳的条件，使暴露于δ因子的携带者发展成重型肝炎。因此，关于δ因子及其对HBV感染者的影响的研究在HBV高发区的我国实属重要课题。

三、比较本组中的抗-δ（+）与抗-δ（-）两组重型肝炎病例的主要临床生化指标和病死率均无明显差异，提示重型肝炎的发生原因和影响预后因素的复杂性，需从多方面深入研究，但抗-δ在重型肝炎中发生率较高，至少为研究重型肝炎的发生机理提供一条可供思考的线索。

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ding to the realistic conditions of our country and the experience of many authors, a new set of diagnostic criteria for SLE was established and systematized into a computer program. Tested with 223 non-SLE cases and 92 confirmed SLE cases, this new set of diagnostic criteria had the rates of specificity and sensivity of 91.9% and 95.7% respectively.

It is considered that the new set of diagnostic criteria is characterized by its comparatively comprehensive content and its conformity to the conditions at home, and it is especially helpful for the early diagnosis of SLE.

**Key words**: Systemic lupus erythematosus; Diagnostic criterion; Computer program (p.47)

## The Measurement of the Surface Tension of Pulmonary Surfactant: Introduction of a Self-made Apparatus

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The clinical significance of the dynamic observation of the changes of the surface tension resulting from pulmonary surfactant and the principle for its measurement were discussed. According to the mechanism of Wilhelmy Surface Tension Balance with modifications, an apparatus for the dynamic determination of surface tension was designed and manufactured. The construction and the specifications of this apparatus were introduced. The results obtained with this apparatus were analyzed and compared.

**Key words**: Surface tension; Pulmonary surfactant; Modified Wilhelmy surface tension balance (p.50)

## A Preliminary Observation on Delta Antigen Infection in 35 Patients with Severe Hepatitis B

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The paper is to report a retrospective study on delta antigen infection in 35 patients with severe hepatitis B (13 subacute and 22 chronic cases). One serum

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sample from each patients was collected at least 21 days (21~156 days)after the last attack of the disease, and anti-delta antigen was tested with EIA method (Abbot kit made in USA) . The upper limit of O.D. value for positive results was calculated as 0.391. It was found that anti-delta antigen was positive in 12 cases(34.3%)out of the 35. 23.1%(3/13)of the subacute and 40.9%(9/22) of the chronic cases were positive. There were 3~5 serological parameters indicating HBV infection in each case. All the 12 positive patients were males of Han Nationality with a mean age of 34 years (a range of 19 to 51) . 11 were from Sichuan province and only 1 from Guizhou. 3 were subacute cases without previous history of hepatitis, and aggravation of the clinical condition occurred in their course; there was a history of acute icteric hepatitis in the remaining 9 cases and 5 out of the 9 were long-term HBsAg carriers. The recent attack of the disease often showed a rapid progression to the severe stage within a month.

It is suggested that delta antigen might be one of the factors leading to the aggravation of viral hepatitis.

**Key words.** Delta antigen; Anti-delta antigen; Severe hepatitis B

(p.54)

## An Investigation on the Vibrational Frequency of C=O Bond in Benzoic Acid

Li Wenjin, et al (Department of Chemistry, Third Military Medical College)

The infrared spectra of benzoic acid in its solid form and in various solvents were determined. The result confirmed that the carbonyl bond of the dimer form of benzoic acid occurs at 1694 $cm^{-1}$, but not at 1653 $cm^{-1}$. The influences of hydrogen bond (polar solvent) and solvent effect (nonpolar solvent) on the vibrational frequency of C=O bond was also studied. In the nonpolar solvent, owing to the increment of the dielectric constant ($\varepsilon$) of the solvent, C=O stretching frequency decreases slightly and the relationship between them can be expressed with the following formula:

$$\frac{(\nu_v - \nu_s)}{\nu_v} = \frac{k(\varepsilon - 1)}{(2\varepsilon + 1)} - C$$

Here K and C are two contants, $\nu_v$ and $\nu_s$ represent the vibrational frequency of C=O bond of benzoic acid in vapor and in solvent respectively.

**Key words.** Benzoic acid; Infrared spectrum; Dimer; Vibrational frequrcy; Dielectric constant

(p.57)

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