日本腦炎、恙蟲病之診斷及治療

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立克次體屬疾病之流病特色

抗原分類	疾病名稱	致病原	傳染媒介	動物宿主	感染症狀	流行區域
Typhus fevers	Epidemic typhus 〈流行性斑疹傷寒〉	*Rickettsia prowazekii*	體蝨	人類、 老鼠	頭痛、發燒、畏寒、出疹	非洲、亞洲、中南美洲的高山寒冷地區
	Endemic typhus 〈地方性斑疹傷寒〉	*R. typhi*	跳蚤	老鼠、貓	頭痛、發燒、畏寒、出疹，症狀較溫和	全世界
Spotted fevers	Rocky Mountain spotted fever 〈落磯山斑疹熱〉	*R. rickettsii*	蜱〈Tick〉	嚙齒類	頭痛、發燒、腹痛、出疹	墨西哥、美國中南美洲
	Mediter- ranean spotted fever 〈地中海斑點熱〉	*R. conorii*	蜱〈Tick〉	嚙齒類	發燒、焦痂、 局部腺病、末端出疹	非洲、印度、歐洲、中東、地中海、美國
	Oriental spotted fever	*R. japonica*	蜱〈Tick〉	嚙齒類	發燒、焦痂、 局部腺病、 有時會出疹	日本
Orientia	Scrub typhus 〈恙蟲病〉	Orientia tsutsuga-mushi	蟎〈Mite〉	嚙齒類	發燒、頭痛、盜汗、 焦痂、出疹、	印度南部、中亞、東亞、 東南亞、澳洲、
Coxiella	Q fever 〈Q 熱〉	*Coxiella burnetii*	吸入被病原體污染微粒 蜱〈Tick〉	山羊、綿羊、牛、家畜	發燒、頭痛、畏寒、盜汗、肺炎、肝炎、心內膜炎	全世界

Rickettsial Infection

1. Gram (-) , obligate intracellular bacteria
2. Vectorborne (tick , mite , fleas…)
3. Spotted fever and typhus groups
   - vasculitis
   - rickettsiae proliferate in the endothelial lining cells of small arteries , capillaries , and veins

Scrub typhus-pathogen

- 1.Pathogen: *Orientia tsutsugamushi*
  (*Rickettsia tsutsugamushi)*
  vector: *Leptotrombidium deliense*
- 2.Transmitted by a bite of chigger (a larval stage mite)
- 主要流行區域分布範圍

-西至巴基斯坦、阿富汗

-東至日本本州北端

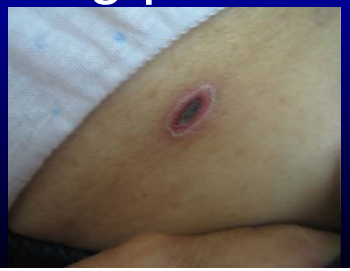
-南到整個東南亞至澳洲東北部及西南太平洋群島

致病原

- 恙蟲病(Tsutsugamushi disease，tsutsu是惡疾之意，而mushi是指恙蟲)又名叢林斑疹傷寒(scrub typhus)
- 病原:恙蟲立克次體(Orientia tsutsugamushi)
- 病媒:恙蟎，屬於蛛形網(Arachnida)，幼蟎(chigger)微小約0.2~0.3mm，肉眼幾乎看不見
- 台灣主要的恙蟲病媒以地里恙蟎(Leptotrombidium deliense)為主

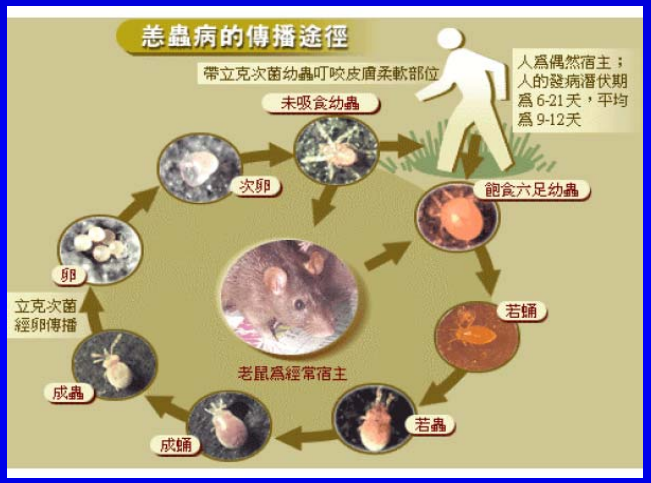
Topic1.Scrub typhus-history

- AD 313, Tsin Dynasty晉朝”葛洪”“人行經草處,沙地被依微小沙虱叮咬,即發生紅疹,三日後發熱,叮咬局部潰瘍節痂”
- 1810: Hakuju Hashimoto, Japanese, first described this disease
- 1927:緒方規雄(Ogata norio), patient serum injected into the rabbit’s testis-repeat this procedure 5 times-gall bladder swelling -isolated Rickettsia orientia
- 1931 Formal name: Rickettsia tsutsugamushi
- 1948: isolation at Kwangchow, Kwangtung province



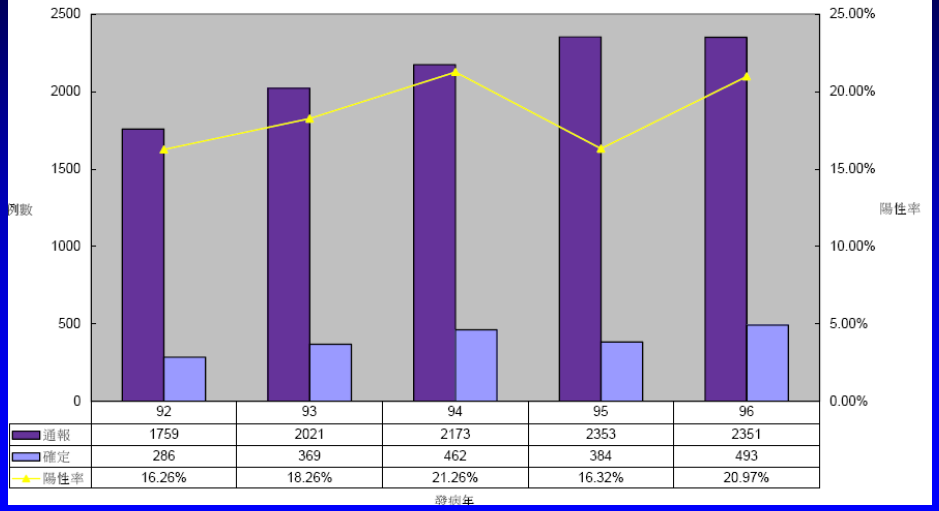
傳染方式

- - 被具傳染性的恙蟎叮咬，經由其唾液使宿主感染立克次體
- **潛伏期**
  - 1~2週，通常為9~12天
- **可傳染期**
  - 不會直接由人傳染給人
- **感染性及抵抗力**
  - 受感染後對同一型別的立克次體有長期保護力，但對不同型別此保護力僅短暫存在
  - 對於生活在流行地區的人，有可能第二次甚至第三次受到感染，不過通常症狀較輕微



http://www.cdc.gov.tw

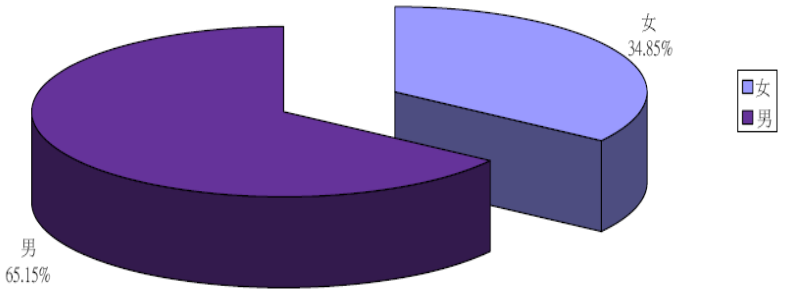
92-96年恙蟲病通報及確定病例數



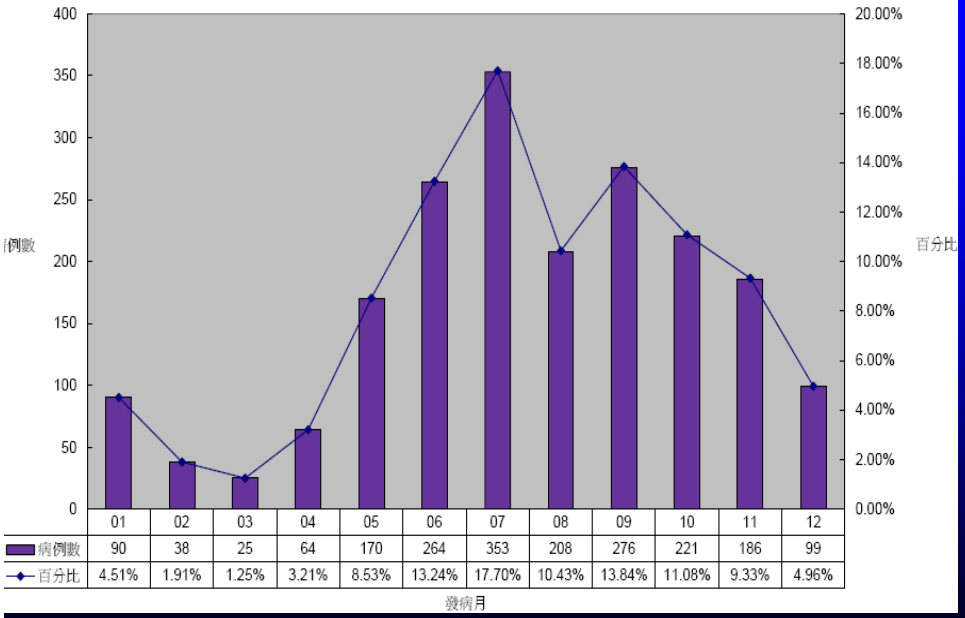
	92	93	94	95	96
通報	1759	2021	2173	2353	2351
確定	286	369	462	384	493
陽性率	16.26%	18.26%	21.26%	16.32%	20.97%

發病年

92-96年恙蟲病確定病例性別分佈圖



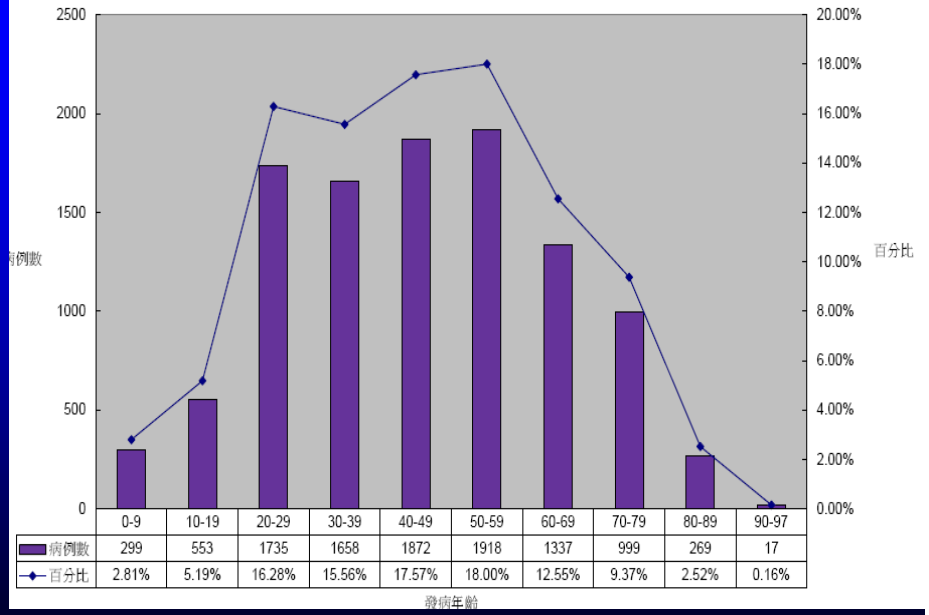
92-96年恙蟲病確定病例依發病月份之分佈



	01	02	03	04	05	06	07	08	09	10	11	12
病例數	90	38	25	64	170	264	353	208	276	221	186	99
百分比	4.51%	1.91%	1.25%	3.21%	8.53%	13.24%	17.70%	10.43%	13.84%	11.08%	9.33%	4.96%

發病月

92-96年恙蟲病確定病例依發病年齡之分佈



	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-97
病例數	299	553	1735	1658	1872	1918	1337	999	269	17
百分比	2.81%	5.19%	16.28%	15.56%	17.57%	18.00%	12.55%	9.37%	2.52%	0.16%

發病年齡

Epidemioloy

- **all year in Taiwan, the peak period May~December**
- **scrub typhus favor high temperature and high humidity, outsides grass**
- **occur in Taiwan, high prevalence in Kngman, Matsu, Penghu, Lanyu, Hualien, Taitung, Kaohsiung**

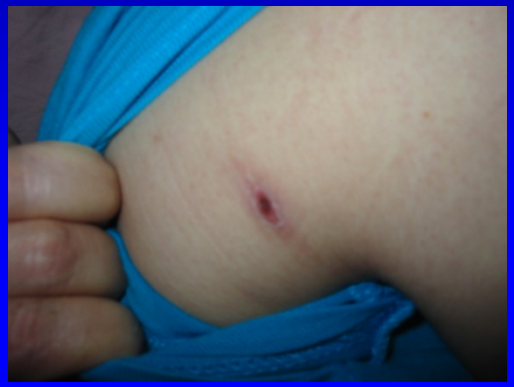
專題報導

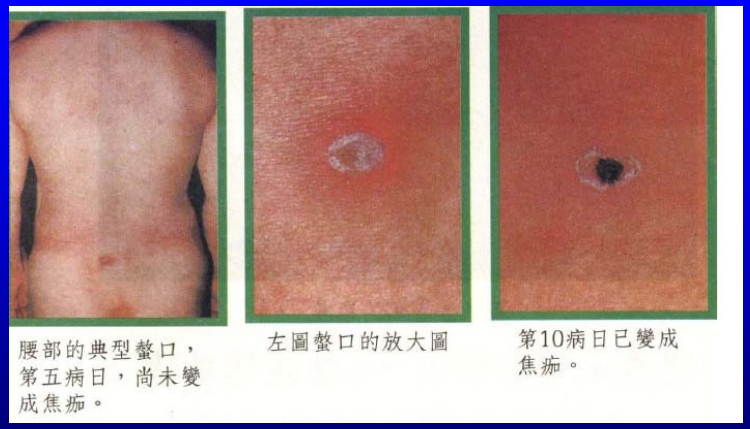
Green.taitung.gov.tw
綠島資訊服務網

Clinical Manifestation (1)

- Rash:
  - 5 days after insect bite
  - From trunk to extremities
  - Macule→papule

  Eschar (50-80%)
- Splenomegaly may be seen
- Complication:
  - Pneumonia, heart, respiratory or renal failure
  - After two weeks incubation , central nervous system occur





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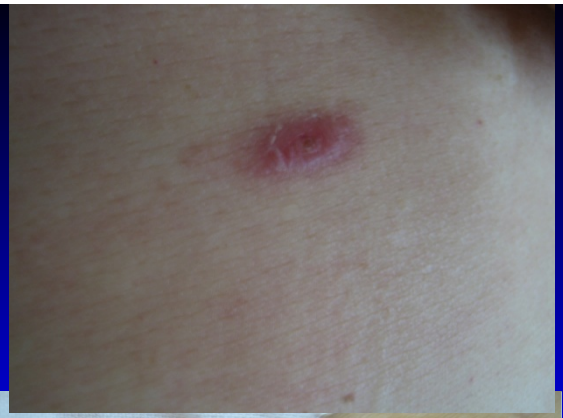
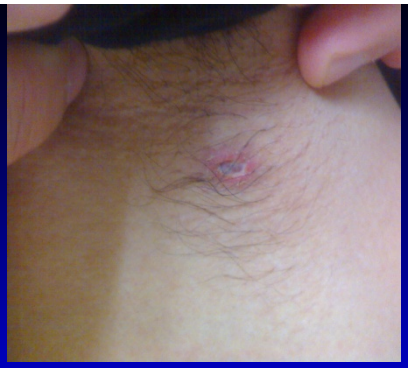
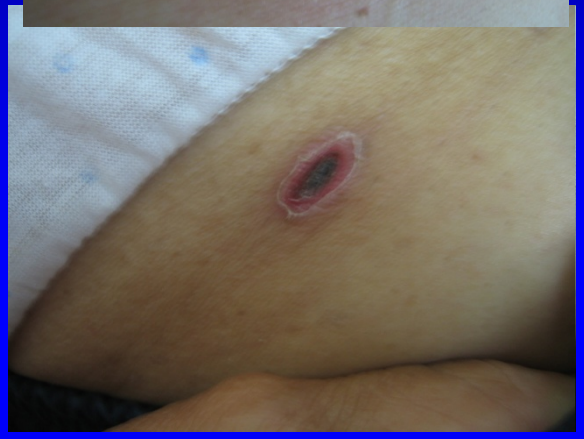
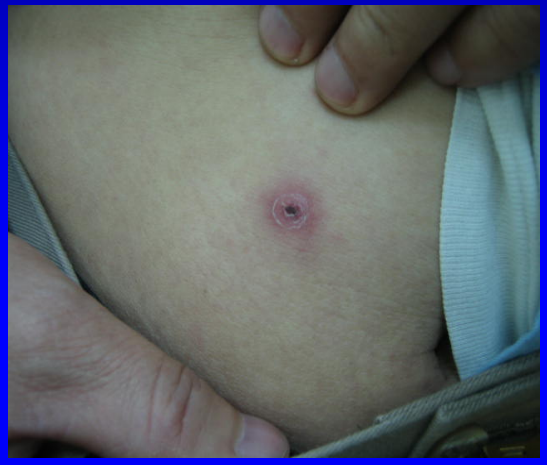
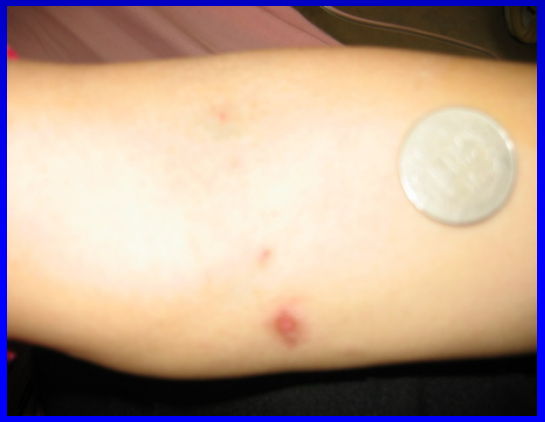
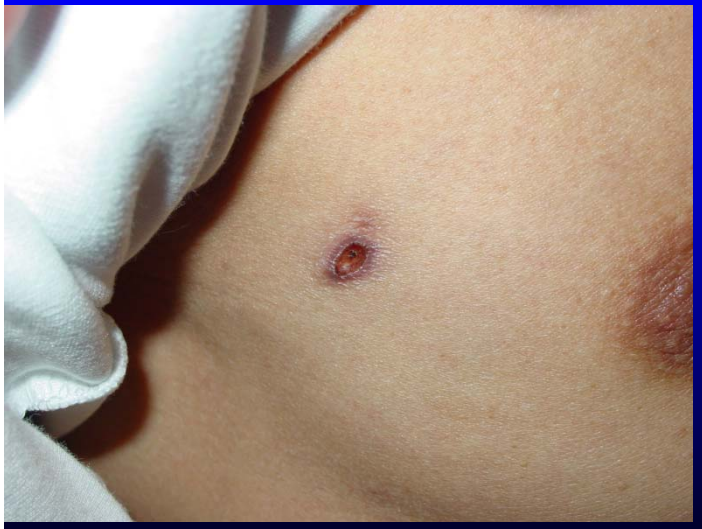
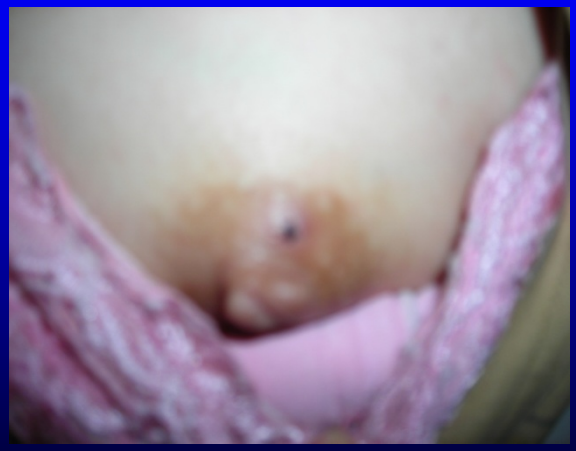
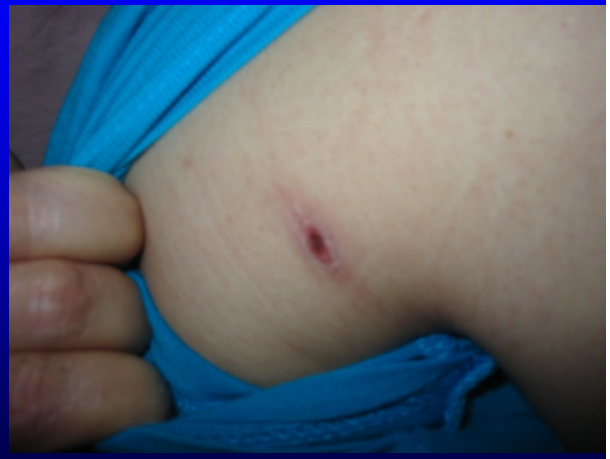
Eschar



臨床表徵1

- 發燒:猝發症，持續性高燒伴隨頭痛、背痛、惡寒、盜汗、淋巴結腫大等症狀
- 焦痂(eschar) :約有50-80%患者可再叮咬處發現潰瘍性焦痂，大都為無痛性。

出疹:發燒4-5天起皮膚出現紅色斑狀丘疹，由軀幹上部擴至四肢＜不出現於臉、手掌及腳掌＞

第9-10病日消退

SCRUB TYPHUS IN JAPAN: EPIDEMIOLOGY AND CLINICAL FEATURES OF CASES REPORTED IN 1998

- A total of 462 cases
- Seventy-six percent of the patients were more than 51 years old, and 36% and 16% of the patients were engaged in farm work and forestry, respectively.
- Fever, rash, and eschar were detected in 98%, 93%, and 97% of
- the patients, respectively.
- Elevated levels of C-reactive protein, aspartate transaminase, and alanine transaminase were detected in 96%, 87%, and 77% of the patients, respectively.
- Disseminated intravascular coagulation developed in 34
- cases and had a unique regional distribution.

Am. J. Trop. Med. Hyg., 67(2), 2002, pp. 162–165

Scrub typhus complication

- August 1993 ~ July 1997, 33 cases of scrub typhus were admitted at Tri-Service General Hospital. Serious complications included pneumonitis 36% (12/33), acute respiratory distress syndrome (ARDS) 15% (5/33), acute renal failure 9% (3/33), myocarditis 3% (1/33) and septic shock 3% (1/33). One patient died of ARDS due to delay in diagnosis.

  Tsay RW, **Chang FY** J Microbiol Immunol Infect. 1998 Dec;31(4):240-4.

- Clinicians should be aware of the potential for complications, when scrub typhus patients are older (≥ 60 years), presents without eschar, or WBC counts > 10, 000/mm3, and serum albumin level ≤ 3.0 g/dL. Close observation and intensive care for scrub typhus patients with the potential for complications may prevent serious complications with subsequent reduction in its mortality rate.

  Kim *et al. BMC Infectious Diseases* 2010, **10**:108

Acute respiratory distress syndrome in scrub typhus.

- This study retrospectively reviewed the medical records of 72 patients diagnosed with scrub typhus from January 1998 to August 2006 in Kaohsiung Chang Gung Memorial Hospital in Taiwan.
- Eight of 72 scrub typhus patients with ARDS were included in the study; the other patients without ARDS were used as controls. The mortality rate for the scrub typhus patients with ARDS was 25%. The eight patients seldom had underlying diseases
- Initial presentations of dyspnea and cough, white blood cell count, hematocrit, total bilirubin, and delayed used of appropriate antibiotics use were significant predictors of ARDS.
- Multivariate analysis showed that albumin, prothrombin time, and delayed use of appropriate antibiotics were independent predictors of ARDS.

Am J Trop Med Hyg. 2007 Jun;76(6):1148-52.

Abnormal liver function in scrub typhus.

- From January 1998 to August 2003 in Kaohsiung Chang Gung Memorial Hospital in Taiwan, we observed 30 patients with scrub typhus, and 29 of them had liver function abnormality.
- We found 89.3% with elevated aspartate aminotransferase (AST) levels, 91.7% with elevated alanine aminotransferase (ALT) levels, 84.2% with elevated alkaline phosphatase (ALP) levels, and 38.5% with elevated total bilirubin levels.
- In our study, there is a close relationship between scrub typhus and impaired liver function tests. Therefore, if patients are found with fever of unknown origin and abnormal liver function, we should take scrub typhus into consideration.

Am J Trop Med Hyg. 2005 Oct;73(4):667-8

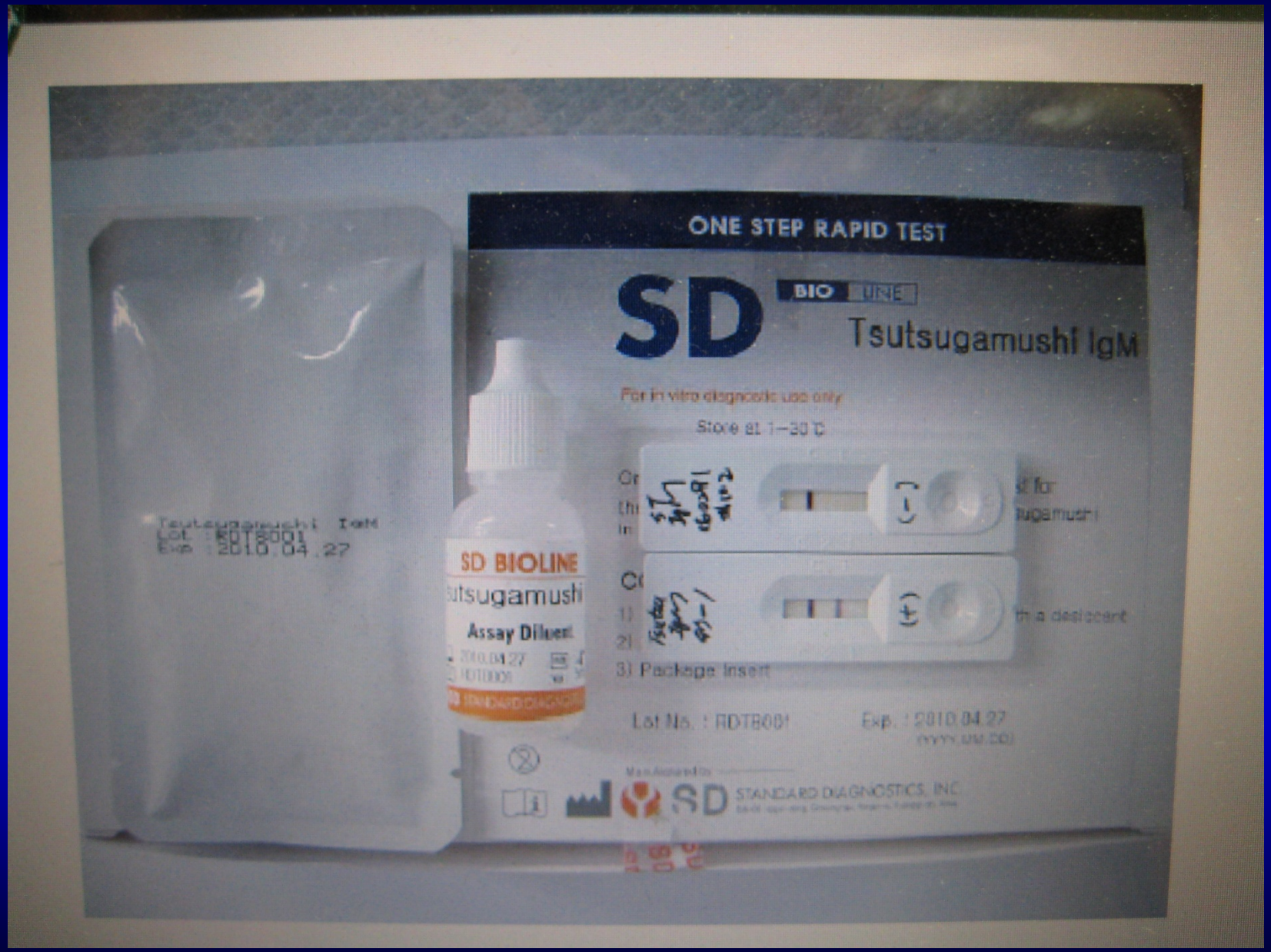
Diagnosis

- IFA (indirect immunofluorescence assay) :
  IgM ≥ 1:80, IgG fourfold rise in Taiwan CDC
- PCR amplification of *O. tsutsugamushi* DNA from blood of febrile patients
- Weil-Felix slide agglutination test:
  half patients have antibody reaction to
  Proteus spp. OX-K,
  Weil-Felix slide agglutination test is not specific.
  sensitive or specificity is not high.
  Proteus spp.have similar antigen with rickettsial antigen. When human got rickettsial infection, human body will induce anti-rickettsial antibody which will be cross reaction with Proteus spp.

Proteus OX-K (+) ---may be associated with scrub typhus infection

Proteus OX19 (+) -- may be associated with murine typhus infection

Proteus OX-K(-), OX19(-), OX2(-)—Q fever


ONE STEP RAPID TEST
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BIO LINE
Tsutsugamushi IgM
For in vitro diagnostic use only
Store at 1–30°C
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Assay Diluent
3) Package Insert
Lot No. : RDTB001
Exp. : 2010.04.27
SD STANDARD DIAGNOSTICS, INC.

Treatment and prophylaxis

- 1. inadequate treatment (insufficient treatment course) induce high relapse tendency, all patient need two weeks treatment course

  Doxycycline: 100 mg bid p.o

  for 7-14 days
- 2. Chloramphenicol:
  - 500mg qid p.o for 7-15 days
  - For children:150mg/kg /day for 5 days
- 3. Ciprofloxacin

Prophylaxis: 200 mg/ every week, keep 3-4 weeks, wearing long-sleeve clothes and trousers, bootleg, use insect repellent,

Prognosis: no treatment-mortality 60%?;

treatment mortality 5%

第四類法傳 一周內通報

恙蟲病預防

- 個人防護措施
- 在野外旅外旅遊或工作時盡量不要進入草叢地帶，注意不要 將皮膚暴露，最好穿著長袖衣褲及靴子，長褲塞進靴子裡。
- 必須進入恙蟎猖獗地區活動者應於身體裸露部位塗抹驅蟲藥劑如Diethyltoluamide (DEET)，以防止恙蟎叮咬。
- 離開易感染地後盡快沐浴，換洗全部衣物。
- 身體不適，請盡速就醫，並告知醫師旅遊史，以免耽誤治療時機。

http://www.cdc.gov.tw

恙蟲病預防

改善環境

- 剷除雜草，特別在住宅附近、道路兩旁以及田埂等人群接觸頻繁的草地，如情況容許，可用焚燒法減低恙蟎密度
- 改變地面的潮濕狀況，至少使地面表層完全乾燥，消除可以形成穩定小氣候的環境

消滅老鼠、恙蟎

- 滅鼠也是重要的工作，鼠類是恙蟎幼蟲的主要寄主，對恙蟎的存活與繁殖有很大關係，如能徹底消滅鼠類將使其不易找到寄主，最終會自然枯死
- http://www.cdc.gov.tw

D/D Dengue fever and Rickettsial diseases

Fever with headache without obvious focus

Relative bradycardia

No

Endemic area:south-east asia
headache、muscle pain、joint pain、retrobulbar pain、back pain、rash
Laboratory：
❶WBC＜5000/ul or normal
❷PLT＜100,000/ul
❸GOT、GPT elevation and GOT ＞ GPT
❹aPTT prologation、PT normal
initial 3 days Segment elevation
the 4th ~6th day after infected
monocytosis

One or two items compatible but not very likely

May inform CDC

Endemic ＋2 kind clinical symptoms + laboratory

Inform CDC

Yes

Eschar

Yes

mountains Climbing, Taitung or Hualien travel history

suspect scrub typhus

❶ WBC＜5000/ul or normal
❷PLT lower
❸GOT、GPT elevated and GOT < GPT
❹aPTT prolongation、PT normal
Animal contact
Anticardiolipin Ab elevation

suspect O fever

No

❶ WBC＜5000/ul or normal
❷PLT lower
❸GOT、GPT elevated and/or GOT > GPT
❹aPTT prolongation、PT abnormal
OX 19 (+)

suspect Murine typhus

日本腦炎

- 1924年在日本爆發大流行
- 1938年日本學者得知經由蚊蟲為媒介而傳染
- 1956年發展出不活性的疫苗。
- 臺灣地區每年都有日本腦炎病例發生，流行地區遍部全省。

節肢動物傳播的病毒性疾病

病毒分類	病毒名稱	傳染媒介	脊椎動物宿主	感染後症狀	流行區域
TOGAVIRIDAE Alphavirus	Chikungunya	蚊子	人類、靈長類	發熱、關節痛、出疹	非洲、東南亞、菲律賓
FLAVIVIRIDAE Flavivirus	Dengue 1, 2, 3 and 4	斑蚊	人類、靈長類	發熱、出血、出疹	遍及熱帶地區
	Japanese encephalitis	**家蚊**	**鳥、豬**	**腦炎、發熱**	**亞洲、太平洋島嶼、澳洲北部**
	West Nile	家蚊	鳥	發熱、腦炎、出疹	非洲、北美、印度地區、中東、前蘇聯、歐洲
	Yellow fever	斑蚊	人類、靈長類	出血熱	非洲、中美洲
BUNYAVIRUS Phlebovirus	Rift Valley fever	斑蚊、瘧蚊、沼蚊、家蚊	?	發熱、出血、腦炎、視網膜炎	非洲、阿拉伯

臨床症狀

- **患者通常在經過5~15天的潛伏期後出現臨床症狀，其典型的病程演進可分為四個時期：**
  - 前驅期 (2~3天)
    - 前驅症狀發作快，主要出現頭痛、噁心、嘔吐、食慾不振、精神不安、發燒或輕微呼吸道感染症狀。
  - 急性期 (3~4天)
    - 高燒、部份兒童呈現抽筋症狀，頸部僵硬、四肢僵硬、深部及淺部反射異常、震顫、言語困難、神智不清、對人時、地不能辨別、甚至昏迷或死亡。
  - 亞急性期 (7~10天)
    - 中樞神經的侵犯較緩，部分病例仍有生命危險
  - 恢復期 (4~7週)
    - 大部分存活病例的神經功能缺損仍存在，其中包括四肢僵硬、無力、腦神經及錐體外徑路的異常。

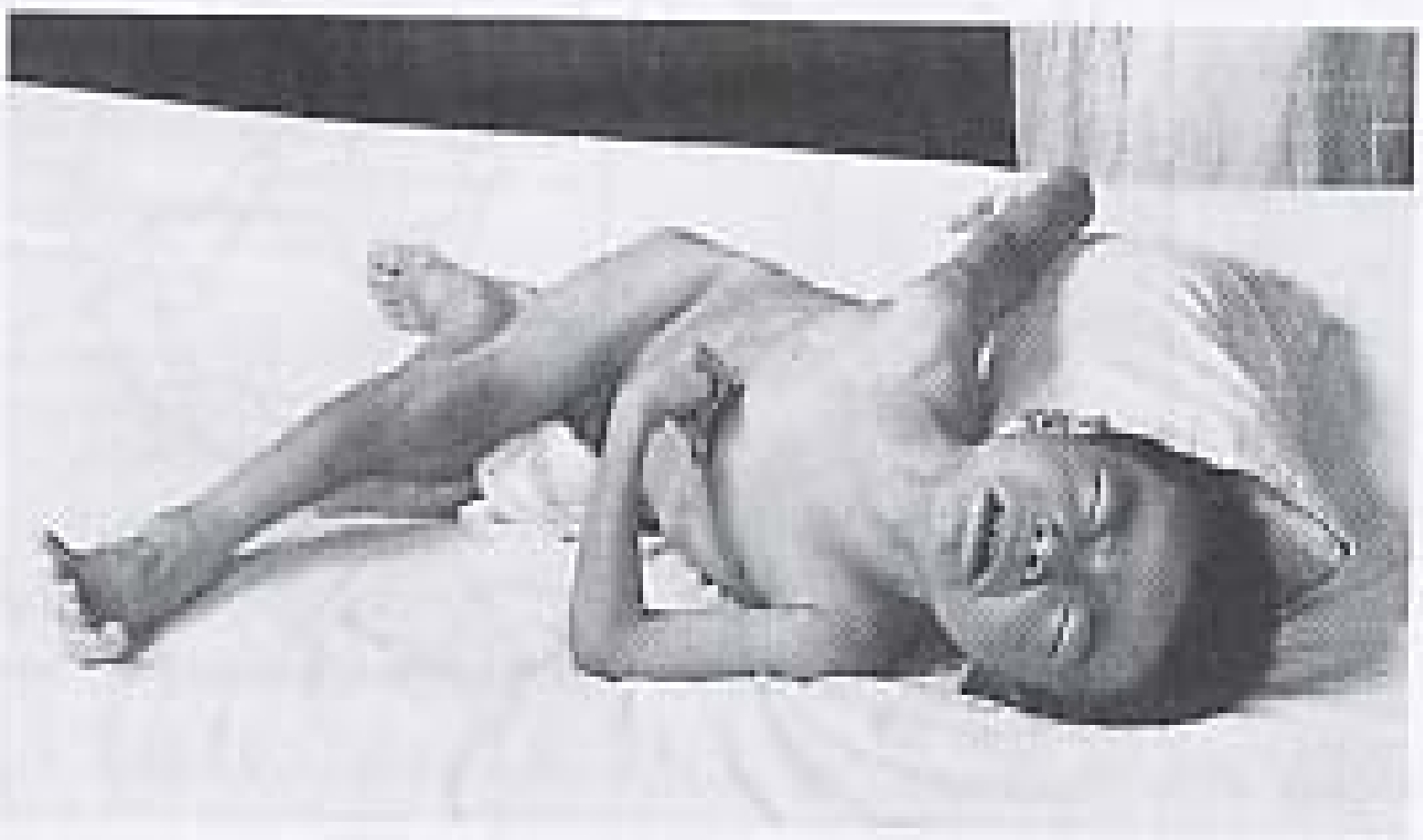
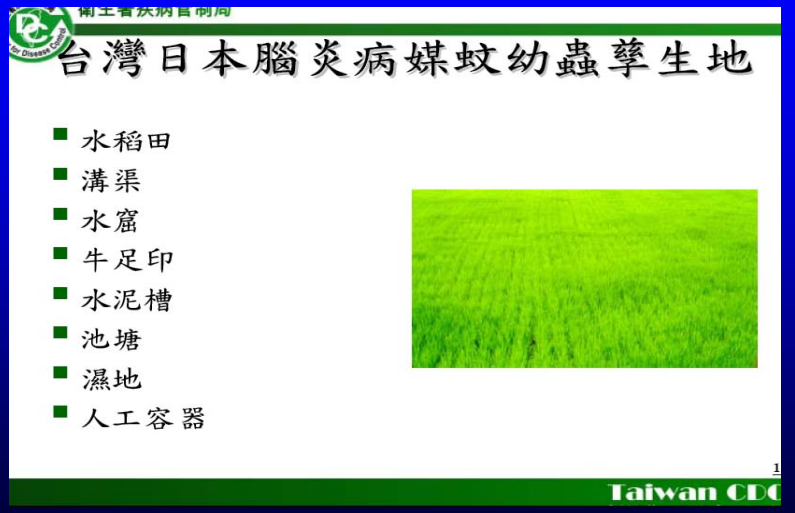


Figure 41.7: A 5-year-old boy with Japanese encephalitis.

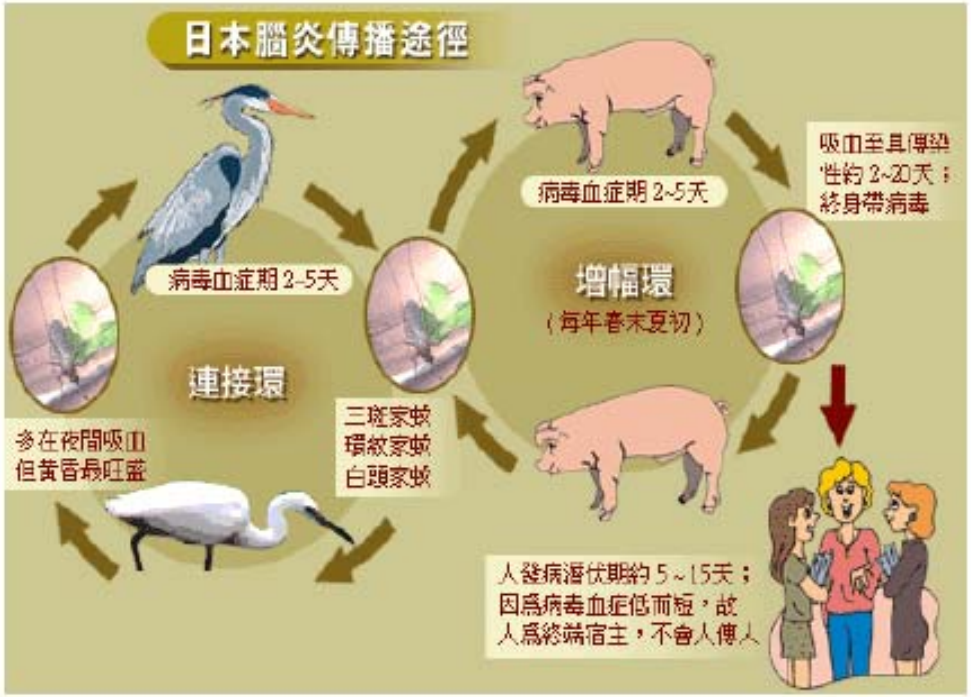
病媒蚊
在台灣傳播日本腦炎之病媒蚊

- 三斑家蚊、環紋家蚊
  孳生於
  - 水稻田
  - 灌溉溝渠
  - 地上小水池
  - 牛足印
  - 水泥槽
  - 池塘
  - 溪流
  - 濕地
  - 人工容器
- 白頭家蚊
  孳生於
  - 濕地
  - 溪流
  - 臨時性積水窪地



傳染方式

- 許多動物(主要為豬、鳥)因被帶有日本腦炎病毒的病媒蚊叮吮而受到感染，但本身不發病。
- 未帶病毒的病媒蚊則在叮吮正處於病毒血症的動物時受到感染
- 而病毒在蚊蟲體內大量增殖**2-20**天後，即可經過唾液傳給健康民眾，而這隻病媒蚊則終生具有傳播病毒的能力。



三斑家蚊的生活史

卵

幼蟲

蛹

成蟲(雌)

潛伏期與可傳染期

- 潛伏期
  - 5 ~ 15天
- 可傳染期
  - 人不會經由人直接傳染給人
  - 蚊子一旦被感染則終生具感染力
  - 豬及鳥類的病毒血症期通常為2~5天
- 感染性及抵抗力
  - 通常小孩及老人感染後較容易發生臨床症狀，其他年齡層則較多不顯性感染。

病例定義

- 臨床病例
  - 出現下列急性神經症狀：發燒、意識障礙、嘔吐、頸部僵硬、抽筋、肌張力異常、頭痛、腦膜刺激症狀及精神症狀（譫妄、意識不清等）。

檢體採檢送驗事項

項目	檢體種類	採檢目的	採檢時機	採檢規定	運送條件	注意事項
日本腦炎	血清	抗體檢測（ELISA）；病原體檢測（Real-time RT-PCR）	急性期（立即採檢）；恢復期（發病14-40天之間）	以無菌試管收集3 mL血清。	低溫	1.若無法取得急性期之血液，請採間隔7天之恢復期血清，分2次送驗。 2.檢體勿加入任何添加物。 3.血清檢體見附錄一2.7.3及2.7.4備註說明，血清採檢步驟請參考附錄一第3.3節。 4.腦脊髓液採檢步驟請參考附錄一第3.6節，由醫師採檢。
	腦脊髓液		住院期間	以無菌容器收集腦脊髓液2-3 mL。	低溫	

實驗室診斷

- 符合下列檢驗結果之任一項者，定義為檢驗結果陽性：
  - 臨床檢體（組織、腦脊髓液或其他體液）分離並鑑定出日本腦炎病毒。
  - 臨床檢體分子生物學核酸檢測陽性。腦脊髓液中日本腦炎病毒特異性之IgM抗體陽性。
  - 急性期（或初次採檢）血清中，日本腦炎病毒特異性IgM或IgG抗體為陽性者。
  - 在最近未接受預防注射及排除其他黃病毒交叉反應的情形下，成對血清（恢復期及急性期）中，日本腦炎病毒特異性IgM或IgG抗體（二者任一）有陽轉或≧4倍上升。

疾病分類

- 極可能病例
  - 符合臨床條件及檢驗結果陽性定義之第三項。
- 確定病例
  - 符合檢驗結果陽性定義之第一、二、四項之任一項。

法定傳染病規範

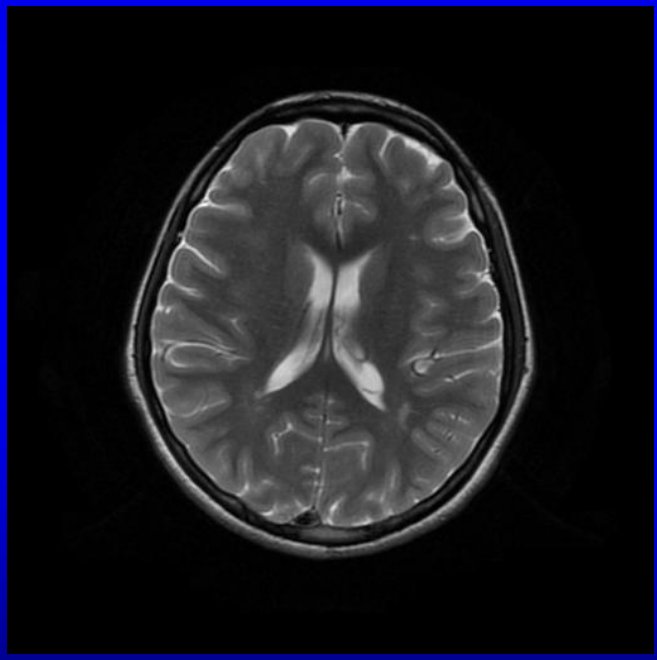
- 疾病分類
  - 屬第三類傳染病
- 通報定義
  - 具有下列任一個條件
    - 符合臨床條件
    - 醫師高度懷疑與確定病例具有流行病學上相關
- 通報期限
  - 於1週內進行通報

實驗室檢查

- 白血球上升 嗜中性白血球增加 輕微貧血.
- 腦脊髓液蛋白質約 50%個案會上升
- 腦脊髓液早期會以嗜中性白血球為主
- 腦脊髓液晚期為淋巴球為主

KMHKH

- Case presentation:
- 23 male
- consciousness change and irritable mood
- CSF Glu:60
  TP: 32
  Lactate:1.1
  Appear:clear
  cell count:0
  PMN/MN:0
  VDRL(-)
  Cryptococcus (-)
  HSV IgM(-)
  blood Glu:85
  Lactate:1.8
  IgG:1240
  ESR:16



Patient Profile & Chief Complaint:

- 43 yrs old, ♂, Car repair workers
- Admission Date：2009/10/11
- Chief Complaint:

  Sudden onset of left lower limb weakness for one day

Present Illness

- 43 y/o male no previous medical history. suffered from fever, muscle soreness since 2 days ago, sudden onset of progressive left proximal lower limb weakness noted 1 day before admission.
- headache, dizziness, general malaise, vomiting, mild cough and intermittent left thigh numbness and neck pain.
- No diplopia, dysphagia, low back pain, muscle pain or dysuria were observed.
- visited LMD but in vain, then visited our ER (10/11)

Physical Exam

- **Consciousness** :Alert, E4V5M6
  BP：113/ 68 mmHg, PR：109 bpm. RR：18cpm, BT：37.9℃

Lower limbs： left lower limb weakness, free activity

Muscle Power

	R't	L't
upper limbs proximal	5	4
distal	5	4+
lower limbs proximal	5	2
distal	5	3-4

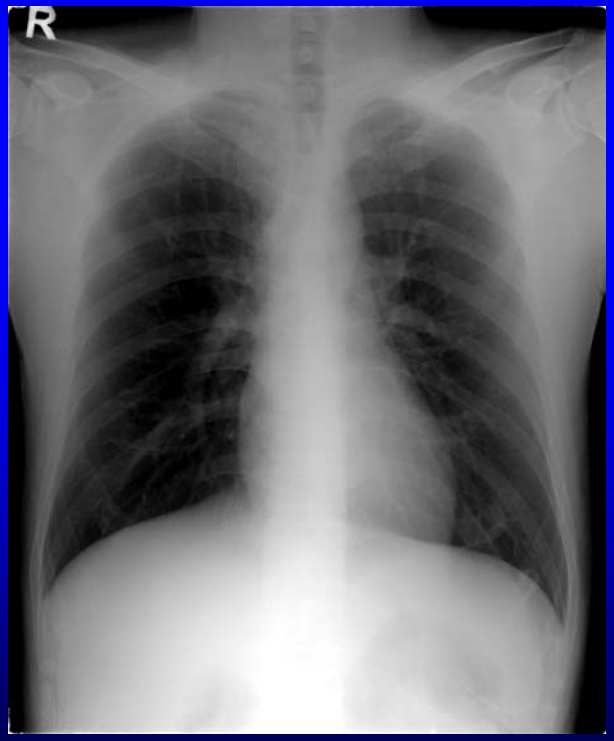
DTR：(0-++++)	R't	L't
Biceps reflex	++	++
Triceps	++	++
Brachiaradia is	++	++
Knee jerk	++	-
Ankle jerk	++	++

Lab Data (10/11)

WBC (10^3/ul)	13.96		**Segment (%)**	84.9
RBC (10^6/ul)	5.02		**EOSIN (%)**	0
Hb (g/dl)	16.3		**BASO (%)**	0.1
Hct (%)	46.2		**Lymph (%)**	7.7
MCV (fl)	92		**MONO**	7.3
PLT (10^3/ul)	178		**CRP (mg/L)**	18.5

CXR(10/11) & Brain CT (10/11)

- No evidence of intracranial lesion



Differential diagnosis

- **Cranial nerve: intact**
- **MP**
  - R L
  - 5 5
  - 5 2
  - 5 4-
- **DTR**
    - R L
    - 2 2
    - 2 2
- **EPS**
- Rigidity (-)
- Bradykinesia (-)
- Bilateral upper limbs postural Tremor (+)

- **D/D:**
- L2~L3 level (no sensory level)
- Suspect drug related (EPS?)
- L-spine radiculopathy
- Myopathy
- Femoral nerve lesion

- **Plan**
- GOT/GPT
- CK, lactate
- T3,T4, TSH
- influenza

Admitted on 10/11

- 10/11
- Fever up to 39 (19:30)
- Stin + Blood culture
- Intermittent bilateral upper limbs tremor and spasm (20:30), left predominant, tonic –flexor posture, suspect seizure, 30 sec~1 min
- Suspect novamin induced EPS

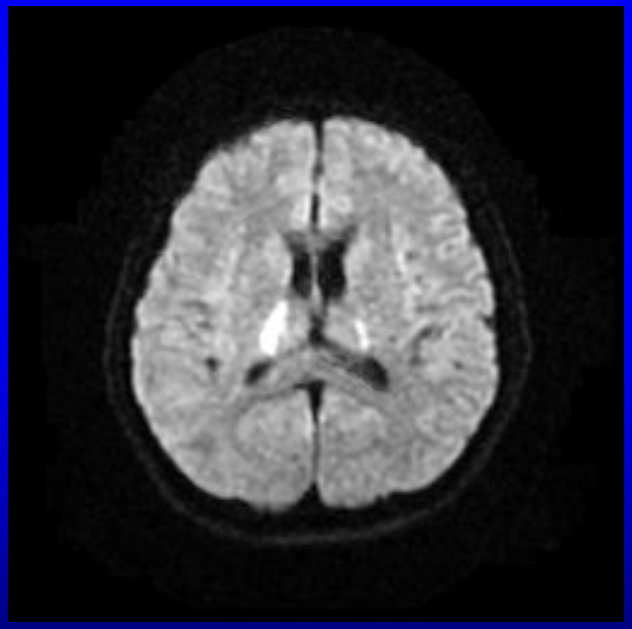
Clinical Course

10/12

- Generalized skin rash (00:40) + fever, suspect stin allergy
- Drowsy consciousness
- Generalized skin rash + fever, suspect stin allergy
- WBC = 12.53 10^3/ul ; Segament Neutro = 88.6 %; CRP = 69.4 mg/l
- Highly suspect meningoencephalitis
- Focal seizure
- Consult Infection, check HIV, TB, JBE

Brain MRT (10/12)

infarctions at bilateral thalami



Clinical Course

10/13

Course

- Drowsy consciousness, E3V3M5
- Lumbar puncture for suspected CNS infection (open pressure 218mmHg)
- Transfer to KMU- NICU

Lab

- Cell count = 177X11/9 mm^3 [0~5]
- PMN/MN = 86/14 % [2/98~5/95]
- TP = 0.19 g/dl [6.60~8.52]
- Glu = 59 [120~200], Smear: CSF, negative.
- Pathology: Increased leukocytes and lots of neutrophils suggest meningitis

Medication

- Ceftriaxone 2g IV Q12H + Vancomycin 1g IVD Q8H + Acyclovir 750mg IVD Q8H
- Doxycycline 100mg PO QD

10/17-10/24 at KMUH

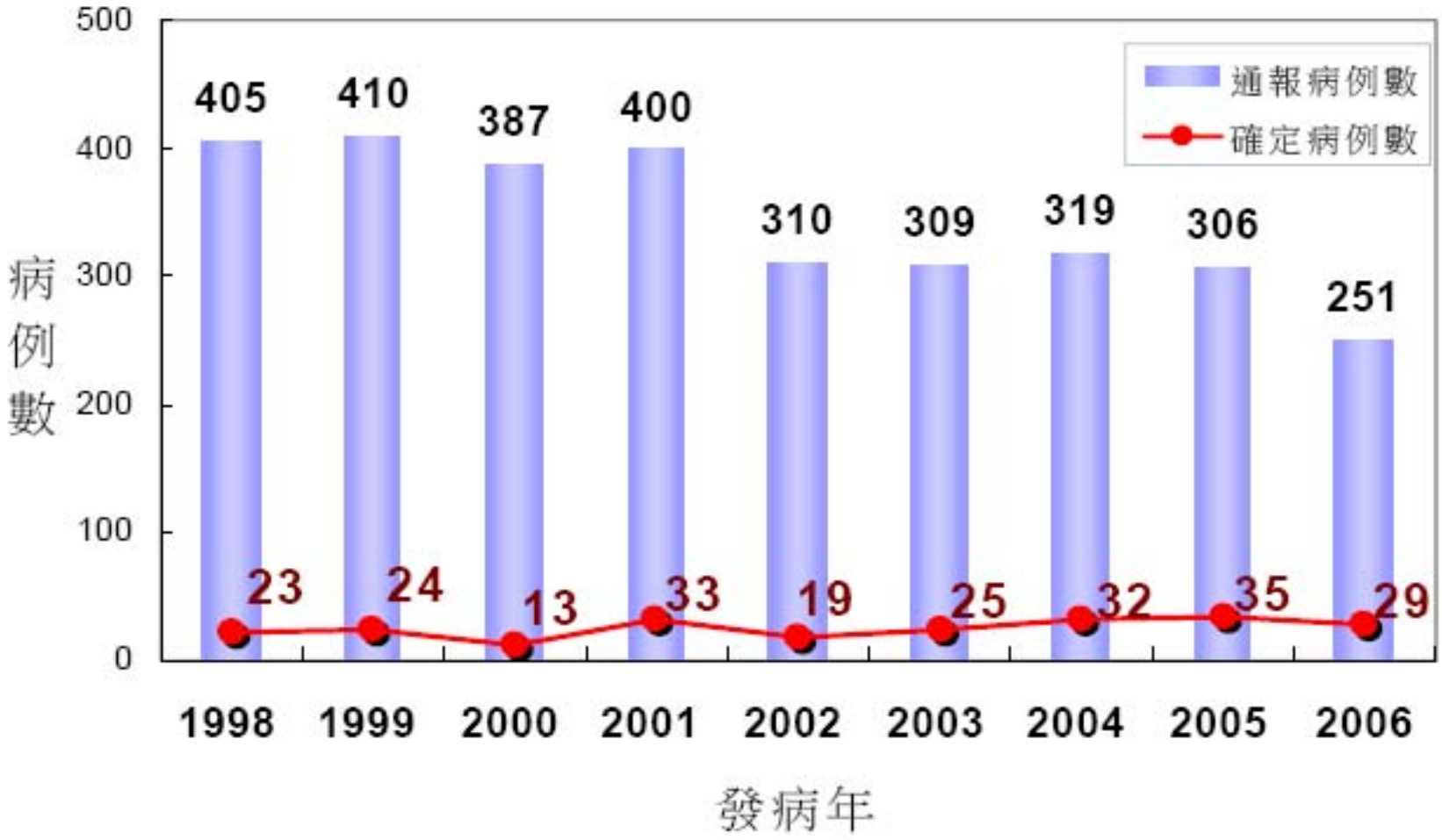
- 10/17 respiratory failure→Intubation →Right lower lobe pneumonia
- EEG, no seizure wave was found.
- lumbar puncture again due to consciousness not improved→

  CNS infection was partial relieved. WBC was lymphocyte dominent→ stop using Vancomycin→ Consciousness was improved
- 10/24: consciousness and pneumonia improved gradually →Extubation
- Mild fever was still noted, much urine amount was still noted→

10/30

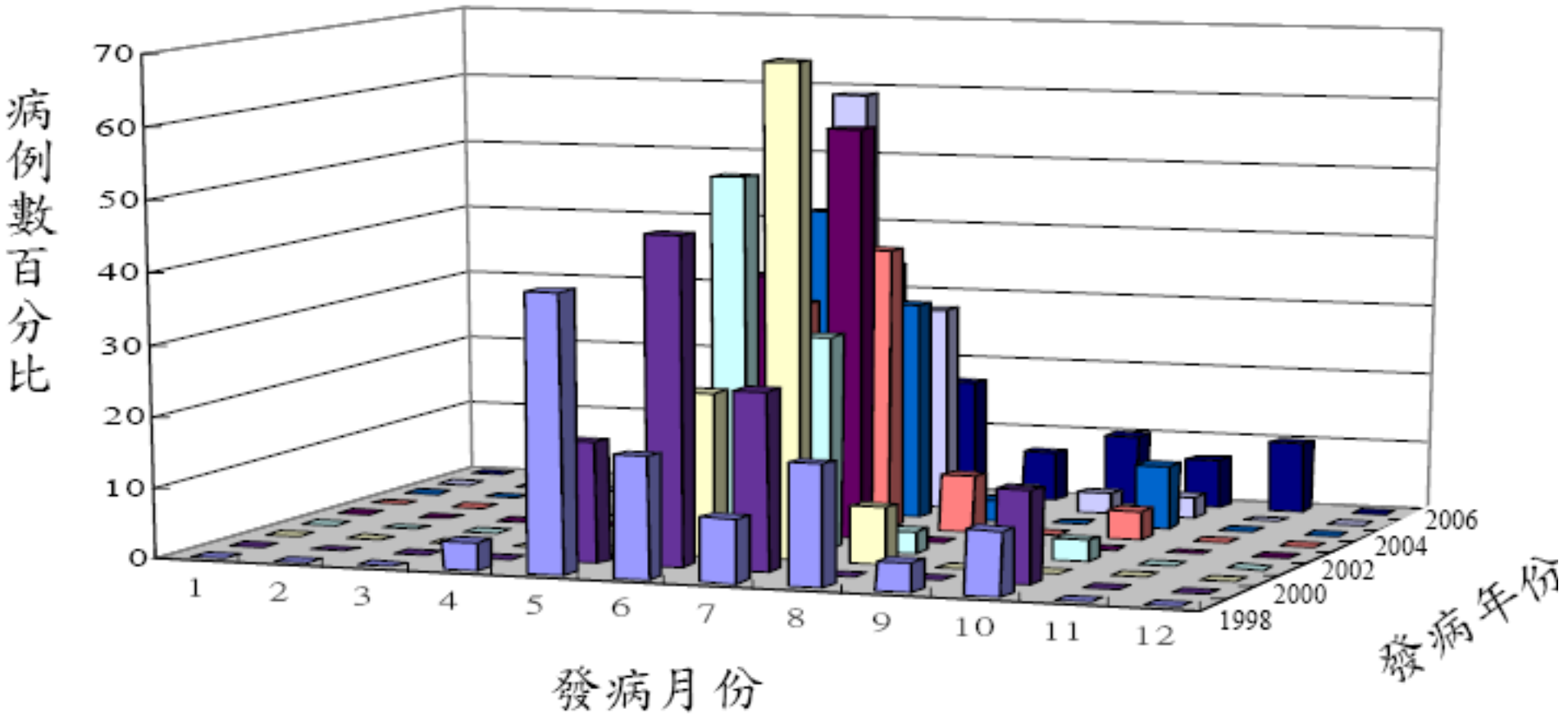
- Pneumonia relieved gradually.
- Pre-renal acute renal failure was impressed, so we increased fulid amount of hydration. Following renal function improved gradually.
- transferred to general ward for further care on 10/28.
- JBE confirmed by positive IgG and IgM. (98.10.13)

1998-2006 日本腦炎通報病例數

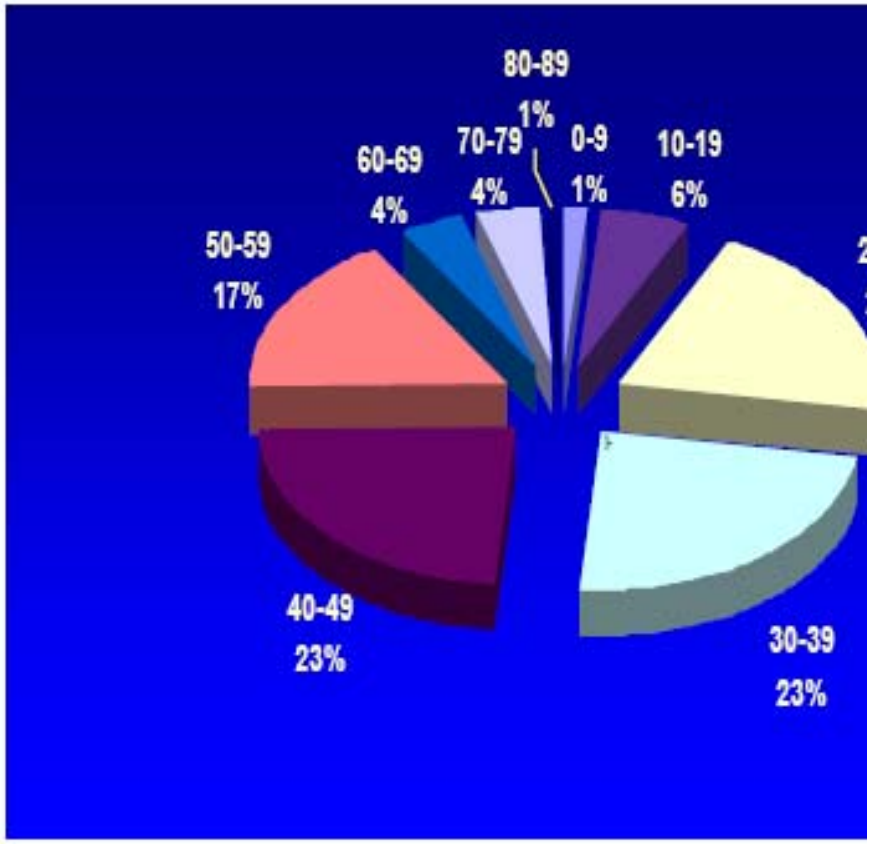


流行病學特徵

- 流行季節
  - 主要在每年5至10月，病例高峰通常出現在6～7月



- 年齡層分布
  - 1966年調查，確定病例中88.3%為0～9歲，15.5%為10～19歲。
  - 1998年以後，確定病例20歲以上佔93%，顯示病例轉而以成人為主。
  - 主要可能原因：
    - 幼兒全面日本腦炎預防接種
    - 鄉村都市化，養豬戶集中化等，使人與病媒蚊接觸機會逐年降低，導致高年齡層易感性宿主增加。



治療及預後

- 治療方式
  - 無針對日本腦炎病毒之抗病毒藥物
  - 依病情給予支持療法
  - 嚴重時要加護病房照護
- 併發症
  - 神經性後遺症
    - 不正常肌張力
    - 語言障礙
    - 運動肌無力等
  - 精神性後遺症
    - 脾氣暴躁
    - 性格不正常
    - 智力不足
      - 常發生在年輕的小孩

日本腦炎的鑑別診斷

- 腦性瘧
- 腦膜炎
- **Rey's Syndrome (雷氏症候群)**
- 狂犬病
- 痙攣性發燒

日本腦炎防治策略

- 早期診斷 早期治療
- 病媒蚊防治
  - A)降低幼蟲
  - B) 病媒蚊控制
- 預防 施打疫苗

疫苗接種條件及限制

- 接種對象
  - 年滿15個月的幼兒，應接受2劑注射，其間相隔2週，隔年再接種一劑，小學一年級時再追加接種一劑。
  - 工作或生活中有感染之虞且有意願接種的成人可前往全國26家署立醫院或分院自費接種。
- 接種時程
  - 每年3至5月
- 禁忌
  - 發高燒
  - 患有嚴重疾病者

疫苗接種條件及限制

- 保護力
  - 疫苗的有效性約85%
- 副作用
  - 局部
    - 紅腫、腫脹、疼痛
  - 全身
    - 發燒、惡寒、頭痛、倦怠感
  - 通常2~3天內消失

避免病媒蚊叮咬

- 盡量避免於病媒蚊活動的高峰期(黃昏)，在豬舍、其他動物畜舍或病媒蚊孳生地點附近活動。
- 請穿著長袖長褲、身體裸露處塗抹防蚊藥劑，避免蚊蟲叮咬，以降低感染風險。

緊急噴藥防治：以成蚊為對象

- 噴藥時機
  - 於接獲確定病例通報
    - 24小時內完成第1次噴藥 (空間噴灑)
    - 4至7日後進行第2次噴藥工作 (空間噴灑及殘效噴灑同時進行)。
  - 在1個月內同村裡有3例以上通報個案時，則立即展開噴藥工作。
- 噴藥範圍
  - 涵蓋個案家戶內外及村里之各建物內外及其10公尺內之畜 (禽) 舍、草叢及竹林等場所。

    (噴藥實施要領詳見「日本腦炎個案殺蟲劑噴灑標準作業流程」)


Thank you!