

European Monitoring Plans for the Management of Outbreak of JEV (Japanese Encephalitis Virus)

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Japanese Encephalitis Virus (JEV) is one of the most important endemic encephalitis in the world especially in Eastern and Southeastern Asia. JEV affects over 50,000 patients and results in 15,000 deaths annually [1]. JEV is the leading cause of viral encephalitis in 14 Asian countries. Approximately, 60% of the world's population lives at risk in JEV-endemic regions of these countries. JEV is an acute, vector borne, noncontagious, and zoonotic viral infection of the central nervous system transmitted by the bite of infected mosquitoes [2]. JEV is a single stranded RNA virus and belongs to the family Flaviviridae [3]. JEV is transmitted between animals by mosquito species *Culex*, *Anopheles*, *Mansonia* [4]. Humans become infected with JEV coincidentally when living or travelling in close proximity to the enzootic cycle of the virus [4]. Encephalitis was first described in Japan in 1871, followed by outbreaks very few years. In 1924 the disease was named Japanese B encephalitis to distinguish it from von Economo's encephalitis, or type A encephalitis (encephalitis lethargic); this was probably a form of autoimmune or post-infectious encephalitis, which caused an outbreak from 1916 to 1927. However, since then, the term "type A encephalitis" has not been used, and the terms Japanese B encephalitis has also fallen out to use [5]. Viral infection is maintained in enzootic cycles between birds and pigs. Water birds are the main reservoir for disseminating the JEV, whereas pigs are the amplifier hosts. Pigs usually do not show signs of the infection other than abortion and stillbirth, but they show continuous viremia, which allows the transmission of the virus to a human via mosquitoes. Humans and other large vertebrates including horses are not considered as efficient amplifying hosts and are, therefore "dead-end" hosts for the JEV [6]. The period of incubation is about 6-8 days, with a range of 4-15 days. JEV has a prodrome of a few days characterized by fever, headache, nausea, diarrhea, vomiting and myalgia, and they may last for several days. These symptoms are subsequently followed by altered mental status, which can range from mild confusion to coma. Headache and meningismus are more common in adults; seizures develop most often in children. Unintentional, rhythmic muscle movements are common, and mutism has been described as a presenting symptom. Sometimes, especially when there is an involvement of spinal anterior cells, JEV cause a syndrome of acute flaccid paralysis, resulting in a poliomyelitis-like presentation. Generally fever disappears in about two weeks as long as with the other neurological symptoms [7]. Therapy for JEV infection is supportive. Different kinds of vaccines (inactivated, attenuated and chimeric) are available and used in several Asiatic countries. In Europe an inactivated vaccine is currently available. Another way to prevent Japanese encephalitis infection is to avoid mosquito bites in endemic rural areas more specifically close to irrigated rice fields and pig farms. Many mosquitoes are most active at dusk and dawn. People can use insect repellents when they are outdoors and wear long sleeves and trousers at these times, or consider staying indoors during these hours [8]. Sporadic introduction of JEV to new areas by migratory birds or by other ways may not necessarily lead to local viral circulation. JEV represents a human health threat in Europe merits further investigation [9]. The presence of JEV in Passeriformes of Tuscany constituting the first evidence of this antropo-zoonotic virus in Italy and also in Europe. The positivity to JEV of some house-sparrows

confirms the potential epidemiological role of this bird in the Flavivirus Mosquito-borne JEV group spread, as observed for other viruses of JEV complex [10]. Confirmation of potential introduction of JEV to Italy and other European countries is urgently needed [11]. In order to increase surveillance in Europe - improving diagnosis, monitoring and treatment of JEV - different elements should be considered. First of all, at the present time there are no standard protocols on how to notify JEV infection and how "contact tracing" should be carry out thought different EU countries. For that reason education is extremely important, focusing especially on transmission pathways and preventive measures; it is also crucial to provide adequate resources to contrast the transmission of this disease. Moreover, in many countries at risk of infection, standard operating procedures and protocols for data exchange are not settled between human and animal health services. Therefore designing and creating a surveillance system for these vector-transmitted diseases should be targeted to develop common procedures and protocols for data exchange.

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