# Leptospirosis microscopic agglutination test in Kota Bharu public health laboratory

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## ABSTRACT

**Introduction:** Leptospirosis is an infectious zoonotic disease caused by *Leptospira spp.* Microscopic agglutination test (MAT) is one of the gold standard confirmation tests and the only tool available to identify the possible serogroups/serovars that caused the disease. MAT has the potential to generate fine-particulate aerosols especially while using a shaker and during frequent transferring of the suspension from the well onto the slide. Objective(s): Firstly, we want to describe the serovar pattern of pathogenic leptospira circulating in Kelantan and Terengganu states. Second, we aim to measure the effect of the MAT antibody titer post-inactivation process. **Materials and Methods:** A descriptive study was conducted from March 2022 to March 2023 to analyze the circulating serovar of pathogenic leptospira from samples received in Kota Bharu Public Health Laboratory. Serum samples from suspected cases of Leptospirosis will be screened using Lepto Rapid IgM or ELISA IgM. Those with positive or inconclusive results will be tested against twenty serovars of Leptospira by MAT. For the second objective, 20 known positive samples were tested using two different procedures. The samples used are archived samples from August 2022 that have been kept in the chiller. These samples were labelled following the previous ID given. Each sample had been separated in equal volume into two tubes. The sample in Tube 1 will undergo an inactivation process. The serum will be heated at 56 °C for 30 minutes, using a water bath. The sample in Tube 2 will skip the inactivation process (non-inactivated sera). Otherwise, the other steps were the same, following standard procedure for Leptospirosis MAT. The MAT titer will be measured and compared between inactivated sera and non-inactivated sera. **Results:** A total of 1575 samples were tested by MAT with a positive rate of 31.6%. 53% and 15.4% of samples gave equivocal and negative results respectively. Majority of samples were from Kelantan (82.9%) and male (66.4%) were predominant compared to females (33.6%). Among 497 positive samples, 474 were labelled as the first sample with the remaining being regarded as the second sample. Fever durations were in between one to twenty-one days with mode of one day and median of 4.39 days. One positive sample can react with more than one serovar. Thus, the five most prevalent serovars were Patoc (253), followed by Pamona (238), Bataviae (219), Hardjobovis (111) and Lai (97). Among 20 serovars used, the least serovars identified were Canicola (9), Icterohaemorrhage (9) and Javanica (7). The MAT titer from inactivated sera and non-inactivated sera were similar with 100% concordance. The antibody titer of all selected positive samples was not affected by the inactivation process. **Conclusion:** Limitations in detecting all Leptospira serovars make the diagnosis becomes more difficult and challenging. Thus, it is crucial to expand the relevant serovars tested accordingly. The inactivation process is an important step to be implemented in COVID-19 positive samples to prevent aerosol-generating procedures and subsequently eliminate laboratory-acquired infection.