

**Final Technical Report:**

**“Enhancing the Diagnostic Capacities of Rabies Disease with Special Reference to Its Pathology and Epidemiology in the Middle East and North Africa”**

**Jordan University of Science and Technology, Irbid-Jordan,**

**3-5<sup>th</sup> of June 2013**

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**Background:**

A three day regional workshop, sponsored by PGTF-UN Development Programme, to address Rabies in the Middle East and North African (MENA) region, was held at the Jordan University of Science and Technology in June 2013. Thirty-three key scientists from universities and governments in 4 countries (Jordan, Palestine, Egypt and Algeria) and from the private sector gathered to present and discuss various aspects of Rabies diagnosis, surveillance and control. They were joined by Dr. Anthony R. Fooks, Animal Health and Veterinary Laboratories Agency – Weybridge (UK), University of Liverpool – UK OIE Reference Laboratory for Rabies, who presented an overview on rabies epidemiology and diagnosis and provided helpful comments and guidance throughout. Using scientific presentations, laboratory sessions, and targeted discussion sessions, participants shared perspectives and gained valuable

information on control of this important transboundary animal disease and public health problem.

The workshop started on June third for three days, 2013 where key persons in the field of animal and public health were invited to attend the opening ceremony where governmental institutions, universities, private sector participated; three minutes speeches were given to each country and sector to address the importance and the needs of such workshop. Each country representative presented some need analysis in the diagnosis, control and prevention of rabies and the needs for capacity development.

The participants recognized the importance of rabies as it kills about 100 children every day. Rabies is the most significant viral zoonosis in the world today. This disease is preventable through vaccination of dogs. Veterinary and medical services must work together and focus (financial) must be on rabies elimination in dogs. Veterinary authorities must lead on eliminating rabies in animals.

To achieve regional goals and move towards global elimination of human rabies transmitted by dogs, a 'minimum investment' required for international coordination and capacity strengthening has been estimated at about US \$10 to 15 million a year for the next 10 years.

Some gaps in the control of rabies in Jordan were stated as:

- 1- Cooperation between ministries (M.o.H, M.o.A, M.o.M and RSCN).
- 2- Enhanced surveillance for Rabies to determine the epidemiology of Rabies particularly in wild animals.
- 3- Public awareness, high risk group (children and farmers).

In Algeria, it was stated that

A national vaccination program for vaccination is established many years ago.

FREE Vaccine is provided

All related programs are headed by the Algerian ministry of agriculture.

Killing of dogs is part of the control program.



Figure 1: shows part of the opening ceremony upper picture and rabid dog with bitten child by a rabid dog lower picture.

## First Day: Two sessions-

### Morning session (4 presentations):

#### 1. Rabies – elimination strategies: June 3rd 2013, Dr. Antony Fooks.

It was stated that 3 billion people in the world at risk of rabies and dogs are the main reservoir. 92% reduction in canine rabies was accompanied by an 82% reduction in human rabies deaths. 98% of rabies deaths follow dog bites and 40% of the victims are children less than 15 year of age.

The disease is preventable if dogs are vaccinated. There is a challenge for securing resources for the prevention and control of the diseases under normal circumstances, and this will be more prominent in conflict areas where veterinary and public health services are impaired or paralyzed.

The diagnosis of rabies antemortum is very difficult, research focused on Nuchal Skin Biopsy.

#### **Pre- / Post-exposure prophylaxis:**

Pre-immunization recommended using tissue-culture vaccine (TCV)

especially for those living in rabies-endemic country or for travelers, Nerve-tissue vaccines (NTVs) discontinued

If bitten, immediate washing of the wound in water

Never suture the wound

Immediate medical advice to assess WHO exposure category (Level I–III)

Passive immunoglobulin (HRIG / ERIG)

Vaccination using WHO-recommended regimen (Thai Red Cross / Essen / Oxford)

Intra-dermal regimens under consideration

#### **Some challenges for the control of rabies:**

- 1- Oral vaccine
- 2- Single dose
- 3- Long-lasting immunity (humoral / cellular)
- 4- Cheap vaccine and manufactured locally

Two types of rabies Immunoglobulins (RIG) are used: human RIG (HRIG) and equine RIG (ERIG). As much of the RIG dose as anatomically feasible should be infiltrated in the area around the wound

***□ Limitations to the use of RIG:***

- Short supply
- High supply costs for HRIG (\$100-250/dose) and ERIG (\$25-50/dose)
- Difficulties in finding immune donors
- Batch-to-batch variation of polyclonal sera
- Risks related to the use of blood products

Rabies immunoglobulins (RIG): RIG provides transient protection during the period before vaccine-induced immunity is conferred (usually after 1 week).

## **2. Role of Vaccine and Sera Center Laboratories in Rabies Diagnosis in Jordan, 2000-2012, Dr. Ali Muhaidat.**

During the period 2000 -2012 more than 220 cases were tested positive. These cases were from different species of animals both wild and domestic species.

Cases came from different parts of the country. And it was concluded that

- Dogs constitute more than 50% of the cases.
- Ruminants constitute about 30% of the cases.
- Horses and donkeys constitute about 10 % of the cases.
- There was an outbreak in 2007.
- 37% of the cases are from Irbid governorate.
- 9% of the cases are from Ajloun .

- More than 60% are from the northern governorates, may be better reporting capacities.

### **3. The role of Pathology in the Diagnosis of Rabies in Egypt, Dr. Elsayed Mohammed Elmanakhly.**

In his presentation, several diagnostic techniques were reviewed. The advantages and disadvantages of each technique were discussed. The distributions of the main pathological lesions were shown in different animal species. The author also discussed the mechanism and pathogenesis of rabies in animals.

### **4. Epidemiology of Rabies in Algeria, Dr. Hemida Houari.**

The author presented an introduction about the disease clinical signs and strategy used in Algeria for diagnosis of the diseases as shown below:

1. Suspected cases reported by veterinarians are submitted to regional veterinary laboratories for subsequent analysis.
2. Immunofluorescence technique is practiced for confirmation of suspected cases.
3. INSTITUT PASTEUR is the reference laboratory for diagnosis.

He also presented the animal population and distribution in the country and prevalence of rabies from 2000 to 2012. It was ranged between 600 to 1200 cases per year.

Furthermore, he presented the control program in his country as follows:

- 1- A national vaccination program for vaccination is established many years ago.
- 2- FREE Vaccine is provided
- 3- All related programs are headed by the Algerian ministry of agriculture.
- 4- Killing of dogs is a good practiced method.

**Afternoon session (3 presentations):**

1. Virological Diagnosis of Rabies in Egypt, Dr. Samy Abdel-Salam khalil.
2. Field Observations on Rabies in Domestic Animals, Dr. Wejdan Al-Hamad
3. Control Strategy of Rabies in the Ministry of Agriculture, Jordan, Dr. Ikhlas Hailat

**Second Day: Two sessions-**

**Morning session (4 presentations and Practical session):**

1. Recent Advances in Diagnosis of Rabies in Jordan, Nabil Hailat.
2. Proposed National Strategy For Rabies Diagnosis, Dr. Wael Hananh.
3. Immunohistochemistry (IHC) and Direct Rapid IHC Test, an Aid in the Diagnosis of Rabies. Dr. Israa Majid Alattar and Nabil Hailat
4. Molecular Diagnosis of Rabies in Jordan. Dr. Mostafa Ababneh

**Afternoon session:**

Practical Sessions (Brain Anatomy): Prof. Nabil Hailat and Dr. Israa Alattar

Practical Training (Histopathology,IHC,DRIT) : Prof. Nabil Hailat and Dr. Israa Alattar

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**Figure 2: shows how the participants dissecting the brain of sheep.**







Figure 3: shows the working station and steps involved for the training of IHC for the diagnosis of rabies.

### Third Day: Two sessions-

#### Morning session:

#### 1. Current Situation of Rabies in Egypt - Epidemiology of Rabies in Egypt, Dr. Adel, M. khadr

- A. The trap, neuter and release {TNR} method which is called Also trap-test-vaccinate-alter-release was used in Egypt in a pilot phase with finance from SPCA (Society for the Prevention of Cruelty to All Animals).
- B. The current system for control of stray dog population is the elimination by poisoning with strychnine or by cartridge shooting.
- C. 21% of killed stray dogs were positive by IFT.
- D. 70-80 human rabies cases per year
- E. Immediate post-exposure vaccination is free of charge for the patient
- F. Use 6-dose IM regimen (at days 0, 3, 7, 14, 28 and 90).
- G. Human rabies immunoglobulin (HRIG) is not available in public sector even for Grad III cases but available in private sector
- H. It is provided on a voluntary basis.
- I. Those vaccinated pay for the treatment.
- J. For dogs there is no vaccination program.

#### These are the recommendations presented by the speaker:

- Control of rabies in stray dogs by

- Destruction or
- Vaccination
- More surveillance studies on bats , wild animals like fox and stray dogs
  - To determine accurately the rabies virus strains and clades circulating in Egypt

## 2. Rabies: Preventative Measures in Humans, Dr. Wail Hayajneh



Dr. Wael described the prophylaxis measures need to be taken when there are animal bites to humans. He reported also treatment of patients suspected to be bitten by rabid animal and emphasized the different protocol used in Jordan. He mentioned that the vaccination of humans and treatment is free by the Ministry of Health. Below is one of his slides to show how a decision is taken.



### 3. Rabies from Food Hygiene Point of View, Dr. Akram Al-Abboodi



Figure 4: shows part of the presentations

Below is a summary of the presentation of Dr. Akram Al-ouboudi

**Judgement:** It is recommended by (Codex Alimentarius Commission, Alinorm 9316 A) In endemic areas carcasses *may be approved* if the animal was bitten 48 hours before slaughter and within 24 hours of slaughter. The bite area and surrounding tissue must be *condemned*, and prevention taken to prevent occupational hazards. In approval cases meat distribution is limited to restricted area

**Differential diagnosis:** Indigestion, milk fever or acetonemia when first seen, foreign body in the mouth, early infectious disease, poisoning

**Discussion:** In a diseased animal, the virus is found in saliva, salivary gland and nervous tissue. Extreme caution should be instituted in abattoirs in order to prevent occupational hazards. Abattoir personnel can contract the disease through surface contact with infected tissue. Infection does not occur by consumption of meat from a rabid animal.

Slaughter may be prohibited during a quarantine period of 8 months following exposure to the disease. An animal suspected of having rabies should be placed under a "Held tag". The warning sign should read "The animal is not to be handled". Any person who was in touch with the animal should thoroughly wash his/her hands with strong soap and/or disinfectant. If possible, the wound should be opened to encourage bleeding in order to flush out the virus and expose the deeper area of the wound. Tincture of iodine (up to 0.001 % aqueous solution of iodine or ethanol 43.70%) should be further applied

Afternoon session:

Closing session:

Discussion and Recommendation and Certificates:



## **Recommendations:**

### **“Enhancing the Diagnostic Capacities of Rabies Disease With Special Reference to Its Pathology and Epidemiology” Held in Jordan June, 3-5, 2013.**

1. It should be reemphasized that rabies is a modifiable disease by OIE.
2. It was recommended that veterinarians, par veterinarians, laboratory technicians and personnel, veterinary students at risk, slaughter house workers and meat inspectors should be vaccinated against rabies.
3. Reactivation of the control of stray dogs and use of animal birth control program and encourage registration of dogs as much as possible.
4. Central national diagnostic laboratory should be established, developed and supported, and a regional well equipped laboratory as a reference laboratory should be established and the OIE guidelines should be followed.
5. Reagents needed for rabies diagnosis should be available and provided to national laboratories and research institutions.
6. Field evaluation for immunity after vaccination should be conducted.
7. Veterinary officials should be aware of the World Rabies Day Initiative, September 28<sup>th</sup>, and awareness activities should be, encouraged, supported and conducted.
8. Initiate and develop molecular research studies to identify the rabies virus phylogeny at the national and regional levels.
9. Direct Rapid Immunohistochemistry should be adopted and practiced whenever is possible.
10. Bats should be investigated for rabies virus.
11. Reporting information in humans and animals should be collected systematically and different institutions should work together in harmony to have a better picture of rabies in a country.
12. Frequent regional capacity building workshops for the diagnosis and control programs for rabies should be encouraged, and governmental, donors; funding foundation should be mobilized to support such effort and activities.
13. Studies on the mechanisms of disease should be considered and supported in different animal species.



**Certificates: These pictures show part of handing in the workshop certificates.**

