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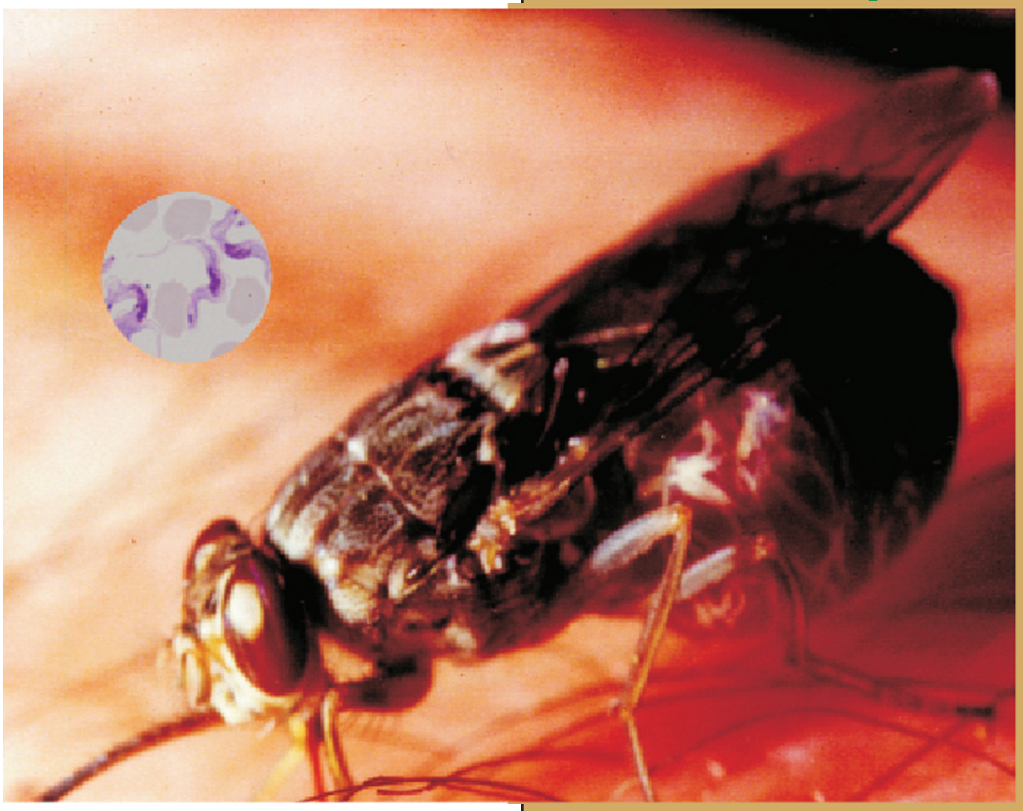

REPORTS & RECOMMENDATIONS

INTERNATIONAL ORGANISATIONS

Moderator: Dr Baba Soumare
Rapporteur: Dr Jose Ramon Franco
The International Organisations presented their activities over the last two years and came up with the following recommendations

WORLD HEALTH ORGANISATION (WHO)

WHO report on human African trypanosomiasis
Current epidemiological situation
During the last two years, the number of new cases of human African trypanosomiasis (HAT) reported to WHO has dropped to below the symbolic figure of 10 000 for the first time in 50 years. Nine thousand, eight hundred and seventy eight new cases were reported in 2009 and seven thousand, one hundred and thirty nine in 2010. The decrease of in the numbers of cases reported was 73.4% during the period 2001-2010.

The chronic form of the disease, caused by Trypanosoma brucei gambiense, is endemic in 24 countries and represents 97% of HAT cases reported in the whole continent. During 2009 and 2010, eleven countries (Benin, Burkina Faso, Gambia, Ghana, Guinea-Bissau, Liberia, Mali, Niger, Senegal, Sierra Leone and Togo) reported no cases. Eight countries namely Cameroon, Congo, Côte d'Ivoire, Equatorial Guinea, Gabon, Guinea, Nigeria and Uganda have reported an average of less than 100 new cases annually. Angola, the Central African Republic, Chad and Sudan reported between 100 and 1000 new cases annually. The Democratic Republic of the Congo is now the most affected country reporting more than 1000 new cases each year.

The acute form of human African trypanosomiasis caused by T. b. rhodesiense is endemic in 13 countries. In the last two years, Botswana, Burundi, Ethiopia, Mozambique, Namibia, Rwanda and Swaziland, no cases were reported. Kenya and Zimbabwe reported sporadic cases; Malawi, Republic United of Tanzania and Zambia reported fewer than 100 new cases each year and Uganda reported between 100 and 1000 new cases annually.

The people screened by active case-finding in previous years maintained the same figures, around 2.300.000 and 2.500.000 people screened yearly, while the health care facilities involved in passive surveillance has increased.

Improving access to best HAT treatment
Public-private partnerships have allowed countries in which human African trypanosomiasis is endemic to improve access to diagnosis and to use the best available treatment options. In April 2009 the combination of eflornithine and nifurtimox was approved by the WHO Expert Committee on the Selection and Use of Essential Medicines for the treatment of second-stage disease due to T. b. gambiense. This combination reduces the duration of drug-treatment; makes it easier to distribute and to administer, while maintaining the same level of efficacy than eflornithine alone. With this new therapeutical option, in 2010 the more toxic form of melarsoprol was used to treat 12% of the cases reported, whereas in 2008 it was still used to treat 51.1% of cases reported. The success is attributed to capacity building and the free distribution of a kit which includes all the materials needed to administer the combination of drugs. These elements have allowed the National Control Programs to appropriate and extend the use of the melarsoprol free treatments.

As the introduction of NECT was based in a single clinical trial, a pharmacovigilance system during implementation was recommended to monitor the efficacy and safety of this new treatment while using in usual field conditions. The pharmacovigilance system was set up with the collaboration of an NGO and

a NSSCP. In one year of life, more than 700 notifications of the side effects from 13 sentinel sites in six countries have been received.

Epidemiological surveillance in low endemic countries

An integrated surveillance system has been developed for disease surveillance in countries listed as HAT endemic but where cases have not been reported in the last ten years. The system is based on the serological screening of selected patients attending referral hospitals in old HAT foci. Positive samples are referred to the WHO collaborative centres for further analysis. This system is following the evaluation period in Benin and Togo. When fully evaluated, it will be extended to other countries.

HAT Specimen Bank

WHO, in collaboration with FIND, has built a HAT Specimen Bank. This Bank is aimed to facilitate the biological material necessary to develop new HAT diagnostic tests to research institutions. Since 2009, the HAT Specimen Bank is fully operating. Samples from patients and non-affected people from endemic areas of both forms of the disease and serological suspects of the Gambiense form are available. Samples have been collected in 13 sites in six different countries (Chad, Democratic Republic of the Congo, Guinea, Malawi, Uganda and United Republic of Tanzania). Currently, samples from 959 patients, 769 controls and 117 suspects have been collected in collaboration with the NSSCPs and research institutions following Good Technical Practice. These samples include different specimens (serum, plasma, buffy coat, saliva, urine and cerebrospinal fluid). The Institute Pasteur in Paris, France, is acting as a Repository Bank for storing samples and releasing the requested material to the research institutions after the clearance of the Exit Committee has been received. Up to date, 21 707 samples have arrived at the central repository and 1866 samples have been distributed to different research institutions in Africa, the Americas, Asia, and Europe.

Collaboration with PATTEC, AU-IBAR and UN sister Agencies

WHO has reinforced links with the African Union (AU) by signing a Memorandum of Understanding between WHO and the Department of Rural Economy and Agriculture of the African Union to join forces to fight African trypanosomiasis within the framework of the Pan African Tsetse and Trypanosomiasis Eradication Campaign. Since 1997, PAAT is the forum where WHO joins FAO / IAEA and AU/IBAR to coordinate support to HAT endemic countries

Collaborative centers of WHO for HAT control and surveillance program

A new collaborating centre, the CIRDES-IRD in Bobo-Dioulasso (Burkina Faso) has been included as WHO Collaborating Centre together with the already existing in the Department of Parasitology at the Institute of Tropical Medicine in Antwerp, Belgium. These two centers give important technical support to the WHO HAT control and surveillance programme.

The Atlas of HAT distribution

Within the framework of the Programme Against African Trypanosomiasis, WHO launched the initiative to map at village level, the control activities and cases reported for the period 2000-2009. This activity is being undertaken in collaboration with the Food and Agriculture Organization (FAO). NSSCPs, NGOs and research institutes by providing input and participating in the development of the data base, which is expected to become an important tool in planning control activities and facilitating disease monitoring and evaluation. At this stage 34 countries out of the 36 listed as HAT-endemic have completed the mapping of the period 2000-2009. The two remaining countries are in an advanced process to reach the final objective. The Atlas of HAT, when finished will be made available in the public domain through WHO and FAO/PAAT websites for the benefit of national health services, scientists, concerned communities, policy makers and donors. Hard copies are also planned to be distributed. WHO will provide NSSCPs with equipment and software including training

for data management for the ownership of the Atlas enabling regular updates at the national level.

Conclusion

Following to continuous control measures implemented during previous years by NSSCPs supported by WHO, bilateral cooperation and NGOs, HAT is under control in most of the endemic countries. Despite the encouraging results and exciting perspectives the process remains fragile and human African trypanosomiasis continues to be a threat in Africa. Indeed, in several countries some foci have been difficult to access and some of them present worrying transmission rates but also in countries where the disease has been put under control there is an high risk of re-emergence if the control and surveillance measures are discontinued . Therefore, countries in which the disease is endemic, should be supported to strengthen their control activities through the identification of isolated pockets of disease transmission, improvement of surveillance and reporting through an integrated approach where surveillance and control activities are undertaken within innovative and adapted approaches into reinforced and operational health systems. Concerning T.b.rhodesiense which its main reservoir is game and cattle, the risk of unexpected epidemics is a concern and a multisector approach involving human health, animal health and natural resources management services is extremely needed.

The decline of cases reported contribute to a lack of interest of bilateral cooperation, NGOs and donors. The awareness of human African trypanosomiasis decline and the setting of other public health priorities contributes to its neglect. Subsequently, there is a risk of stagnation of control and surveillance which already occurred in the late 60s and which led ultimately to the return of the disease.

To avoid history repeating itself, the awareness of the disease should be maintained. The advocacy for priority ranking of the disease in the health agenda of disease endemic countries and donors must continue. Control and surveillance must be strengthened. Research institutions have to be supported to accelerate the process to provide new control and surveillance tools to contribute towards developing new strategies to involve health systems in a cost-effective and sustainable control and surveillance of human African trypanosomiasis.

The agreement with PATTEC and the coordination with UN Agencies should not only help to synergize efforts and avoid duplications but also assist in the sensitization of health decision-makers in disease-endemic countries to keep HAT in the National Health Agenda.

The meeting RECOMMENDS

- WHO to continue the support to countries to strengthen control activities in areas of high transmission and for identification of isolated pockets of disease transmission
- To develop innovative and sustainable surveillance approaches and adapt to the different epidemiological situation.
- To complete the Atlas on HAT and provide countries with equipment and software, as well as training for data management, in order to enhance country ownership and regular updates at the national level.

FOOD AND AGRICULTURE ORGANIZATION (FAO)

FAO considers the tsetse and trypanosomoses control as the way to improve food security in the framework of sustainable agriculture and rural development. The contribution of FAO to the 37 affected African countries through assistance to plan, execute and monitor integrated strategies of intervention is recognized and appreciated.

FAO has continued its activities in three working components:

- Coordination and reinforcement of Program against African Trypanosomoses
- Normative and information activities

- Guidelines for control of HAT have been produced
  - Operational activities or technical assistance to affected countries
  - Different Projects of technical assistance have been developed in several countries.

- FAO has launched, in collaboration with IAEA the Atlas of Tsetse and Animal African Trypanosomoses

Discussions with African Union are on going to reinforce the cooperation between PAAT and PATTEC

The meeting RECOMMENDS

- FAO continue the normative activities
- To maintain the technical assistance to countries
- To further strengthen cooperation with partners in the field, especially PATTEC
- To reinforce the capacities in data management and analysis
- To contribute to quality control and quality assurance of project implementation as well as monitoring and evaluation.

PROGRAMME AGAINST AFRICAN TRYPANOSOMOSIS (PAAT)

The external review of PAAT and PAAT structures reported at the last ISCTRC had been duly considered by the PAAT Secretariat. The recommendations of this external review has also been considered and were approved; they are in the process of being implemented. It is in this connection that a PAAT strategic plan has been developed and the potential for development of a work plan in support of PATTEC, national and sub-regional initiatives in the context of sustainable agriculture, rural development and human health (SARDHH) has increased.

Publication of tsetse and trypanosomosis information (TTI) and PAAT technical and scientific series has continued.

A memorandum of understanding with IFAH has started yielding fruits by attracting support from others for the setting up of the two proposed quality control and quality assurance laboratories in Africa.

The Meeting RECOMMENDS

- PAAT to circulate the strategic plan
- To reconstitute the PAAT structures based on the recent evaluation
- To reinforce the collaboration and synergy between PAAT and PATTEC
- To reinforce the participation in training and other capacity building programmes
- To continue the publication of TTI and PAAT technical and scientific series

INTERNATIONAL ATOMIC ENERGY AGENCY (IAEA)

IAEA continues supporting Member States in their efforts against the tsetse and trypanosomosis (T&T) problem. In November 2009, the African Union Commission and IAEA signed a Memorandum of Understanding to enhance their cooperation in support of PATTEC. The IAEA specific expertise and experience lie in the technology transfer of SIT in support of the PATTEC objectives.

The Centre International de Recherche-Développement sur l'Élevage en zone Sub-humide (CIRDES) in Bobo-Dioulasso, has been recognized as an 'IAEA Collaborating Centre in The Use of the Sterile Insect Technique for Area-wide Integrated Management of Tsetse Fly Populations'.

Following the contact between IAEA and PATTEC, FAO, WHO and several national PATTEC coordinators for information on training needs and priorities, two regional FAO/IAEA training courses will be held in East and West Africa in early 2012.

First component of IAEA work is "normative" activities, including the development of standards, guidelines, manuals, etc.

Second component of IAEA tsetse programme is Research and Methods development including research at the FAO/IAEA Agriculture and Biotechnology Laboratory and Coordinated Research Projects (CRPs).

The Insect Pest Control Laboratory (IPCL) has worked on validation of techniques and strategies for integrated management of the tsetse salivary gland hypertrophy (SGH) virus that is hampering the mass rearing of Glossina pallidipes. Additional efforts were focussed on sex separation of tsetse flies in the late pupal stage and the development of standardized methods for long-distance bulk shipment and aerial release of chilled sterile tsetse fly males.

The Agency manages two relevant CRPs: "Improving SIT for Tsetse Flies through Research on their Symbionts and Pathogens" and "Applying GIS and Population Genetics for Managing Livestock Insect Pests".

The most important component is the support provided by IAEA under its Technical Cooperation Fund. IAEA currently provides technical assistance through one regional, one sub-regional and five national TC projects.

IAEA assists AU-PATTEC and several T&T affected Member States in capacity development relevant to the planning, baseline data collection and feasibility assessment and implementation of area-wide IPM, with a possible SIT component.

The meeting noted with appreciation the efforts made in the planning of the two regional FAO/IAEA training courses to be held early 2012 in eastern and western Africa.

The meeting RECOMMENDS

- IAEA to continue its support to capacity building
- To maintain the current support to national and regional tsetse control projects, including new projects, and extending to the next cycle, the on-going projects
- To adopt the use of valacyclovir antiviral drug to reduce the Salivary gland hypertrophy virus infection in G. pallidipes tsetse colonies.
- To continue the support for the use of SIT component in the context of the AW-IPM programme to

control insect pests (i.e. tsetse) where it is feasible

GLOBAL ALLIANCE LIVESTOCK VETERINARY MEDICINES (GALVMED)

GALVMED is an Animal Health Product Development & Access Partnership, focusing on sustainable poverty alleviation in the developing world. GALVmed contributes to addressing the challenges of accessing available new products. African trypanosomiasis being one of the priorities has been recently added to the portfolio.

Development of a proposal on AAT was initiated in June 2009, focussing on the development of control tools. This proposal is expected to complement and strengthen existing activities and projects, (i.e. vector control) and to ignite interest in research towards AAT vaccine from different institutions. The project is planned for 6 years with a budget of £24m and it includes: novel field Diagnostic tools development, improved trypanocidal drugs (Chemotherapy), initiate the development of an effective vaccine, and a baseline evaluation of current control tools. It also considers the establishment of at least 2 laboratories on the QC of Trypanocides currently used in Africa.

The strategic Partners are AU (PATTEC, PANVAC, IBAR), FAO: PAAT, IAEA-FAO, IAEA, IFAH, DFID and DNDi.

EASTERN AFRICA NETWORK FOR TRYPANOSOMOSIS (EANETT)

The EANETT is a Regional Tsetse and Trypanosomosis (T&T) Research and Capacity Building Network to undertake research that would contribute to the effective management of T&T.

The new approach has considered creation of a forum of existing Regional and international consortia and networks working on T&T aimed to share facilities, expertise, information and avoid duplication of efforts and includes HAT Platform, BecANet, African Network for Drug Discovery and Diagnostics Initiative (ANDI) and any existing and future networks willing to join.

EANETT has been contributing to addressing the recommendations of ISCTRC through collaborative activities supported by various partners

INTERNATIONAL CENTRE OF INSECT PHYSIOLOGY AND ECOLOGY (ICIPE)

ICIPE mission is to improve the wellbeing of people in the tropics through research and capacity building in insect science and its application. The approach of ICIPE is integrated pest and vector management and insect based income generating technologies.
The experience of ICIPE in developing technologies for vector control, community mobilization, empowerment and organization for undertaking tsetse and trypanosomosis control in different ecosystems, underlying the capacity building component is recognised. Work on the introduction of sustainable adapted new tools and strategies for arthropods management continues.

CENTRE INTERNATIONAL DE RECHERCHE-DEVELOPPEMENT SUR L'ELEVAGE EN ZONE SUBHUMIDE (CIRDES)

CIRDES has the mandate to lead activities of research and development (R&D) in order to improve the animal health and contribute to increased productivity. The research projects undertaken include attractant odours in order to improve the performance of traps; this is ongoing. Also, genetic population studies on G.

palpalis and G. tachinoides, anti salivaria inmunoresponse, chemoresistance and other activities conducted by the IRD team based in CIRDES are on-going. CIRDES also collaborates in control activities in Burkina Faso, Ghana, Mali, Cote d'Ivoire, Guinea and Senegal. Capacity building is also a commitment of CIRDES including training of national control programme staffs, a course on GIS application and data base management, and training of technicians and farmers on tsetse control.

INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE (ILRI)

ILRI research on Trypanosomiasis is focussed on the evaluation and control of trypanocidal drug resistance in cattle, genetics of trypanotolerance and the sustainable management of trypanotolerant livestock of West Africa.

The project on trypanocidal drug resistance is investigating methods for the evaluation of trypanocidal resistance, the dissemination of strategies for the prevention of chemical resistance in 5 countries with the evaluation of their impact. The genetics of disease resistance research made use of a new combination of approaches to identify the genetic determinants of trypanotolerance in Ndama cattle with a view to introducing this trait into zebu breeds.

The research in trypanotolerant ruminant in West African aims at removing existing barriers to the in-situ conservation to safeguard their trypanotolerant trait of global significance. The project aims at developing and implementing models for community-based conservation and management of critical habitat for these species.

DRUGS FOR NEGLECTED DISEASES INITIATIVE (DNDI)

It is a Non-profit drug research & development (R&D) organization addressing the needs of the most neglected patients, included human African trypanosomiasis.

In its portfolio is the clinical development of Nifurtimox - Eflornithine co-administration in the treatment of Stage 2 HAT and the preclinical and clinical research of oxaborole SCYX-7158, the preclinical study of new nitroimidazoles, Fexinidazole clinical trials are planned for the year 2012. Compound mining is on-going to discover new molecules for HAT.

PATTEC

Modérateur : Issa Sidibe
RAPPORTEUR : Charles Mahama

Nigeria, Mali, Tanzania and Equatorial Guinea presented their national Tsetse and trypanosomiasis status reports. They presented concisely the historical and current information on the tsetse and trypanosomiasis presence, as well as the strategies to implement effective and sustainable interventions. It was clear from these reports that all countries had the fundamental objective of eradicating tsetse and trypanosomiasis under PATTEC. The PATTEC Coordinator from the African Union Commission (AUC) and the FIND representative presented two additional reports. PATTEC coordinator gave an overview of the activities carried out by the initiative over the past 10 years. During this period, the activities of PATTEC coordination office focused on advocacy and the development of bankable projects in partnership with tsetse infested countries. The coordinator informed the participants about the importance of advocacy by the office for resource mobilization in support of the eradication of tsetse and trypanosomiasis in Africa. He said no other

development partner had committed resources to date apart from the African development Bank (AfDB). He urged participants not to depend entirely on external funding, but seek for internal funding of their projects. The coordinator also requested other organizations involved in research and control of tsetse and trypanosomiasis to keep PATTEC office informed on their activities in Africa for harmonization purpose.

A report was presented on the use of Sequential Aerosol Technique (SAT) for tsetse fly eradication in areas of 10,000 squares in Kwando-Zambezi region by Zambia tsetse eradication Program. The report described the technical and logistical requirements to be satisfied in order to achieve successful SAT operation. The result of the operation was a corresponding decrease in the prevalence of trypanosomiasis in cattle, 8% to 0%. The challenge was securing funding to expand the area of the intervention. Emphasis on the importance of effective environmental monitoring as a part of the operation was made.

The use of bait technology for the removal of G. palpalis gambiensis of Loos islands of Guinea in West Africa was presented. The work showed that the nets impregnated with insecticide (ITNs) have been quite effective and have reduced the population of tsetse flies to very low levels, almost to the point of eradication. However, it was reported that riverine species of flies were still able to survive in low numbers, even if the transmission of the disease was minimized. The challenge was to maintain the suppression effort. In a similar report, Ghana indicated that ITNs were used to remove impressively G. palpalis palpalis in the riverine forest of the Eastern Region of Ghana, and this method may be used to protect swine production systems in peri-domestic livestock.

National PATTEC coordinators of Ghana, Burkina Faso, Kenya, Uganda and Mali presented their reports on their national programs implementation status. With AfDB funding, the countries had made significant progress with respect to the baseline surveys, tsetse suppression, awareness, capacity building and sustainable land management. Ghana and Burkina Faso were able to conduct a joint SAT operation, which had achieved a level of reduction of approximately 99.6%. The lesson learnt is that the SAT alone may not be able to eliminate riverine tsetse, and therefore other methods such as the sterile insect technique should be considered in the future. However, the SAT has the potential to effectively suppress the tsetse fly over large areas in a short period of 6 weeks.

Discussions on the presentations focused on the evaluation of gains by PATTEC since its inception. A general consensus emerged from the participants that these gains must be quantified in order to allow a better understanding of what happened in the past 10 years.

COUNTRY REPORTS
Moderator: Nicholas Kauta
Rapporteur: Issa DEGOGA

During this session, the following countries presented their reports:
Tanzania, Chad, Republic of Sudan and Republic of South Sudan, Burkina Faso, Guinea Conakry and Angola.
Tanzania: the report covered two years: from 2009 to 2010.

- T.b. rhodesiense is the dominant parasite.
- 11 foci are involved.
- 350 clinical cases, with 2 cases in 2011
- The scale is underestimated.

Chad :
The report covered two years: 2009 and 2010

Population at risk: 150 000 inhabitants
Four foci are involved: Tapol, Goré, Moussala and Mandoul

Data collection through:

- Passive surveillance by way of fixed and active surveillance posts.
- Screening is done using CATT with dilution at 1/8
- 2009 : 23939 people screened and 215 cases diagnosed
- 2010 : 36799 people screened and 212 cases reported
- Conclusion : 60798 people screened and 427 patients diagnosed

Guinea Conakry:
This is the most affected country in West Africa. The parasite involved is T.b. gambiense Active surveillance is coupled with vector control.

Angola

- 14 mobile teams
- In 2009 :52 cases through active screening
- 243 cases through passive screening
- In 2010 : 51 cases through passive screening
- 159 cases through passive screening
- The disease involves seven municipalities. It is widely spread out.
- Vector control integrates aerial spraying.

HUMAN AFRICAN TRYPANOSOMIASIS (HAT)

Moderator: Theophile Josenando
Rapporteurs: Enock Matovu

Sessions 6 and 7 dwelt on general aspects of HAT ranging from the global status, through key challenges to control and possible implications of asymptomatic carriers to control of epidemics. Session 6 started with akey-note address by Dr. Perre Simarro, the head of WHO HAT control and surveillance program and covered the current status, indicating the significant decline of reported cases and maintenance at elimination level in several countries. The improvement in treatment safety by introduction of NECT was highlighted, together with the accompanying increase in treatment cost from €28 (melarsoprol) to €322.9 (NECT). There is therefore great need for more support and commitment from donors. PATTEC was recognized as a key ally to help consolidate gains made so far in HAT control by addressing the tsetse problem.

A presentation was made on health seeking behavior in DRC and noted with concern the delays in definitive diagnosis, with most cases being diagnosed on their 4th visit. This calls for strengthening of the public healthcare systems and provision of accurate diagnostic tests at the centres. The following 3 presentations dwelt on problems encountered by HAT control programs in the DRC, including those in remote areas still dogged by sporadic instability, where prevalence can be as high as 3%. Reports were also made on the increasing cases of HAT arising from on spot blood transfusion in rural DRC due to absence of cold storage facilities to support blood transfusion services. It was reported that in 2010 alone 12 cases of HAT were attributed to blood transfusion. This necessitates the inclusion of CATT screening into the routinely required testing prior to on-spot transfusion. In West Africa, a study was undertaken describing models for HAT surveillance in areas where there is apparently low or no active transmission. This outlined different strategies depending on the levels of endemicity, suggesting limiting of active surveillance to areas of high endemicity and having in

place a functional passive system where endemicity is low.

A presentation was also made on the Atlas of HAT that has mapped cases over the past few years with good precision, using hospital records and GPS-collected coordinates. This atlas has been used to devise a model for systematic estimation of HAT risk; this model has allowed an accurate determination of risks through out T. b. gambiense-endemic countries. It is based on actual reported cases and takes into consideration the population density. A study to explore the phenomenon of trypanotolerance in HAT, citing seropositive individuals and actual cases followed for up to 10 years. It was reported that a subset of cases became negative, implying that there may be spontaneous self-cure in a tiny proportion of infected individuals. Given their possible contribution to the disease reservoir, seropositives need to be followed-up since treatment would not be justified due to toxicity of available drugs. Results of a related investigation on immunological determinants to the different responses to trypanosomes after inoculation into the body showed that the fate of inoculated trypanosomes and actual disease progression depends on the cytokine balance that could be parasite strain dependent or even arise from polymorphism in cytokine genes themselves. For example, seropositive individuals that never became parasitaemic were shown to have elevated levels of IL-8, while those who became parasitaemic had elevated IL-10 and low IFN-□. A study carried out in DRC did not provide any evidence to suggest that HAT abolishes protective effects of vaccines used in the endemic area, as was previously observed in laboratory animals. The aim of the study was to investigate measles antibody titres; which demonstrated no significant differences between HAT cases and non-cases.

The possibility of a T. brucei biophotonica generation of cells that emit light to enable real time non-invasive visualisation of trypanosomes in rodent models for better understanding of infection progression was reported.

Results from various studies on diagnostics reported significant advances towards improvement in screening and case detection. Two presentations decried the persistent requirement for large scale trypanosome cultures for production of antigens for the CATT, which is also faced by the challenge of cross reactivity that leads into the characteristic false positives. One presentation reported screening for peptide mimotopes that mimic the VSG with the ultimate aim of their being used in place of whole trypanosomes. The second presentation described expression of recombinant VSG in yeast (Pichiapastoris). The yeast system was reported to have similar properties of post-transcriptional modifications to those of trypanosomatids (particularly N-glycosylation) and as such is expected to produce recombinants that are very closely related to the native antigen. Up to 20mg of purified recombinant antigen was obtained from 1 litre of medium. These two presentations set the stage for production of antigens that could be used in rapid diagnostic tests (RDTs) for HAT screening. A report was made of another study demonstrating the immune trypanolysis (TL) test as a reliable indicator of exposure to T. b. gambiense that can be used to guide surveillance strategies in apparently inactive foci in west Africa; only areas where TL positive individual can still be found need to continue with surveillance for possibility of outbreaks. Other investigations explored improvement of parasitological tests for diagnosis, as well as molecular tests for surveillance. Use of the buffy coat to load onto mAECT columns coupled with examination of Lymph node aspirates was reported to give the highest parasitological sensitivity in detection of T. b. gambiense. The utility of the PCR in diagnosis, staging and post-treatment follow-up of T. b. gambiense in the DRC was explored. The sensitivity of PCR on stage II patient blood was generally low. The PCR was also shown not to be a reliable tool for staging; 6/7 classical stage I patients with PCR positive CSF were successfully cured with pentamidine. In the case of follow-up, CSF in 20% of successfully treated and cured patients remained positive for the entire period of monitoring, indicating that PCR would not be useful in this context. Neopterin as a biomarker for HAT staging and follow-up was also reported . It was demonstrated that Neopterin and Igm measurements in CSF are as accurate as cell counts in staging of T. b. gambiense, while metallic metalloproteinase (MMP-9) was best for T. b. rhodesiense, particularly when

coupled to CXCL-10 and CXCL-13 to increase the area under curve (AUC). Neopterin was reported to be the most accurate follow-up biomarker; its CSF level drastically diminishing after successful treatment thereby confirming cure with 100% specificity by month 12.

Under chemotherapy of HAT, exploration of factors leading to relapses in Angola was undertaken with suggestions to use Eflornithine even in stage I patients in order to overcome this problem, the associated logistical requirements for administration of the drug notwithstanding. Work was presented on nifurtimox-eflornithine combination therapy (NECT); one exploring its feasibility in rural areas, while the other was a report of phase IIIB NECT field trial that examines its use under usual field conditions outside restrictions of typical clinical trials. The former underlines the requirement for sufficient staff to enable working in 3 shifts, in addition to adequate training for all categories of staff, if the benefits of NECT are to be fully realized. NECT field reported no significant differences from phase IIIA clinical trial findings; the most frequent adverse events (AEs) were still gastrointestinal in nature, while the fatality remained at 1.6%. There were no unexpected safety signals of concern, even in children who were included in this study. A related study focused on pharmacovigilance in all countries that use NECT. Very preliminary data was reported; only expected AEs were observed, the case fatality rate was 0.9% and 8 relapses had so far been observed. These findings indicate that NECT is a toxic drug albeit well tolerated. Two candidate molecules under development as safe oral drugs capable of treating both stages of HAT were also reported. Fexinidazole, an old compound that was revisited as a trypanocide is now under phase I trials with observed parameters indicative of a drug suitable for treatment as a single daily dose, whose absorption and other pharmacokinetic features improve if administered with a meal. This drug is ready for phase II trials in patients. The other candidate is an oxaborole (SCYX-7158) from SCYNEXIS company, USA. This exhibited potency against in vitro parasites and was efficacious for both HAT stages when administered orally in rodent models. Subsequent studies revealed no genotoxicity and also point to an easily absorbed drug, with a half life of elimination of 25hrs. Phase I evaluation of SCYX-7158 will soon be executed.

The Meeting RECOMMENDS that:
Resources should continue to be committed to support research for the development of new tools, to facilitate control efforts even in countries that are at elimination level, (to counter the enormous requirements that would arise in case of resurgence).

The methodology for estimation and mapping of risk of T. b. gambiense infection should be extended to T.b. rhodesiense HAT.

Further exploration of human trypanotolerance to assess its role on disease epidemiology and for possible clues to novel therapeutic and prohylactic candidates should be undertaken.

The reported alternative sources of diagnostic antigens should be further pursued to provide other options for HAT screening tests such as RDTs.

Novel biomarkers, particularly neopterin, should be actively pursued to develop test of cure that will reduce the post treatment follow-up period.

Fexinidazole and SCYX-7158 must continue their development to establish their utility as novel and safe trypanocides that could eliminate the requirement for lumbar puncture that is presently a stumbling block for effective control efforts.

AFRICAN ANIMAL TRYPANOSOMISIS (AAT)

Moderator: Oumar Diall
Rapporteur: Giuliano Cecchi

Ten presentations that were made during this session:
The keynote address provided a summary of past, current and future control and research strategies and policies. The use of integrated approaches to tsetse control and elimination was advocated. It was also stressed that the choice of the most appropriate techniques to be deployed under different intervention areas must be grounded on knowledge of the specific epidemiological, agro-ecological, and socio-economic conditions. Full engagement of different stakeholders was also emphasized.

The second presentation explored anti-trypanosomal drug resistance in a cattle grazing reserve in Nigeria. The study concluded that resistance is suspected in parts of the reserve, and laboratory methods should be used for confirmation. Sensitization of actors involved and appropriate, professional administration of drugs are advocated to avoid onset or exacerbation of the problem.

A study addressed the binding of trypanocides to bovine erythrocytes, which influences the pharmacokinetics of drugs. The study indicates different binding levels for different drugs, the levels being highest in homidium and lowest in diminazene.

An improved molecular method for the detection of diminazene resistance in T. congolense was presented, which is based on filter papers for sample storage. Its applicability under field conditions was explored. The study points to the potential of this method in the context of large scale surveys for trypanocidal drug resistance.

A study addressed the sensitivity and virulence of T. evansi in Kenya. Drug resistance, possibly caused by the inappropriate use of drugs, may be implicated in observed treatment failures in camels. Strategic use of the available drugs and sensitization of camel keepers was advocated.

The use of trypanocides in Mauritania was also studied. These drugs are mainly used to treat infections in camels. The study revealed a substantial, probably excessive use of trypanocides, some of which are not appropriate for the species of trypanosomes found in Mauritania. This was of great concern.

A comparative study explored the occurrence of trypanosomosis in tsetse-infested and tsetse-free areas in Ethiopia. Results revealed high of prevalence of T. vivax in tsetse free-areas, thus pointing to the high probability of mechanical transmission.

Results were presented of a study that addressed the control strategies used by camel keepers in Kenya. This revealed a limited use of tsetse and biting fly control strategies; inappropriate use of drugs was observed. The need to impart knowledge on correct diagnosis and treatment was highlighted.

A new initiative by FAO and IAEA was presented, that aims at developing global databases and maps of African animal trypanosomosis. Full engagement of all stakeholders was advocated, to ensure that the full potential of the initiative is realized.

Another study investigated the situation of tsetse and trypanosomosis in an area of South Eastern Uganda, finding widespread presence of T. congolense and T. vivax, and low prevalence of T. brucei. The role of cattle trading in the spread of sleeping sickness was also mentioned.

The Meeting RECOMMENDS

- That efforts be made to address the problem of incorrect usage of trypanocidal drugs, as well as the usage of sub-standard products, in order to tackle the emerging issue of chemoresistance. This could be achieved by strengthening the professional provision of veterinary products and services to livestock keepers. AU/IBAR to take lead in collaboration with organizations such as FAO, PAAT, RECs, GalvMed and private sector and report the progress at the next ISCTRC meeting
- There is great need to harmonize drug regulations at regional level in view of increased cross border trade
- In view of the climate changes experienced in the recent past, more emphasis should be placed on improving camel health and productivity in order to mitigate drought and shortages of milk in the affected countries.

GLOSSINA BIOLOGY, CONTROL AND ERADICATION

Moderator: Chilongo Kalinga
Rapporteur: Joyce Daffa

16/19 papers were presented in the 15 session on Glossina Biology, control and Eradication.

1) Affected countries are urged to integrate appropriate tools and guidelines during data collection in order to support decision making in control and eradication programmes.
2) Where there are suspicions or existence of mechanical transmission of trypanosomosis is established, interventions should include identification and elimination of factors that contribute to the increase in population of biting flies.
3) Noting with appreciation efforts made in suppression/eradication of tsetse flies, countries are urged to strengthen stakeholder collaboration from initiation to implementation, monitoring and evaluation to sustain achievements.

LAND USE, ENVIRONMENT AND SOCIOECONOMICS

Moderator : A. Hippolyte
Rapporteur: Gecchi Giuliano

Three papers were presented on advocacy, socio-economic impact of bovine trypanosomiasis and knowledge of Fulani and Botonou communities in Benin on AAT. It was observed that impact studies undertaken in T&T are not supported by adequate quality baseline data and this is an area of concern. It is expected that removal of the tsetse should result in improved livelihoods of livestock keepers ; hence the need to quality benefits. In view of the low number of presentations;

T he meeting RECOMMENDS that :
T&T proposals should address socio-economic issues; to be supported by governments of affected countries through sustained advocacy; this will encourage enhanced participation in future ISCTRC conferences
More emphasis should be placed on socio-economic component in projects to enhance adoption of technologies and impact on beneficiaries

POSTERS

Moderater: Ahmed H.A/Rahman

Rapporteur: Jean – Baptiste RAYAISSE

At the beginning of the session, the president stressed the fact that posters is not a second class presentation but it a proper scientific paper meant to help the young scientists to publish their work and to get exposed to the international scientific community.

From a total number of 58 posters accepted for the conference, only 37 were posted:

- Out of 24 posters accepted only 15 posters were available on the theme of HAT. Information was presented in these posters addressing aspects of epidemiology, diagnosis, chemotherapy and control and zoonosis
- 10 posters out of 19 accepted for AAT were posted. They addressed the issue of chemotherapy and epidemiology.
- 10 posters out of 13 accepted in the field of Glossina biology were posted. They included 1 poster on tabanids behavior.
- 2 posters addressed the issue of advocacy.

Recommendations

- It was suggested that authors writing posters are to follow the format recommended by the scientific secretariat of ISCTRC for writing posters