Quantification of onchocerciasis prevalence in endemic areas has been challenging given the need to replace the painful skin snip method. This study evaluated the potentials of Onchocercal Rapid Diagnostic Test (RDT) for onchocerciasis emerging diagnostic advancement in 8 onchocerciasis endemic Local Government Areas (LGAs) of Ogun State after a decade of ivermectin treatment. Using systematic sampling method, 32 communities (8 from each of the eight endemic Local Government Areas) were selected for the study. A total of 380 consenting participants provided blood specimen which were tested for IgG antibody against the O. volvulus antigenuv using the Alere™ SD BIOLINE Onchocerciasis IgG RDT. Also, DBS stored on Whatman™ Protein Paper cards were obtained from SOBI-participants (15% of study population), for ELISA reference testing. Data were analyzed using custom script in R and SPSS 20 software while gaussian mixture model, expectation maximization was used to classify Optical Densities (ODs) for positive and negative samples from ELISA results. Demographic information showed that 58% were females and 42% males with varying age distribution. Three hundred and sixty four representing 3.9% of total population were anti-Ov IgG positive by RDT. Although prevalence varied among different age groups in all the LGAs, highest prevalence 14.8% (79/533) was recorded among respondents within the age 25–34 years. The other age groups appeared to have had the same trend in prevalence except respondents in age class 1–4 which recorded the lowest 3.2% (45/1328). It was observed that onchocerciasis increased with increase in age. Student T test revealed no significant difference [P>0.05] between prevalence and sex. Of 226 4600 males, 170 were sero-positive representing 10.3% and 22(4) females representing 6.8%. Among the 8 LGAs, Odedu LGA recorded the highest (15%) prevalence while no LGA recorded the least. The prevalence of onchocerciasis was not significantly different among the different age groups recorded in all the LGAs, highest prevalence 14.8% (79/533) was recorded among respondents within the age 25–34 years. A logistic regression model incorporating factors of RDT negative resulted in a new strategy in onchocerciasis mapping towards achieving elimination in Africa by 2020.

**Results**

### Overall Prevalence of onchocerciasis in Ogun State.

The cumulative sero-prevalence of onchocerciasis recorded in the 8 LGA’s studied was 9.3% (Table 1). Prevalence in each LGA studied.

Three thousand, eight hundred and ninety five (3895) persons ranged from 5 years to 98 years (mean age 31.2 ± 10.3). A total of 380 persons were sampled from each LGA. Of the participants sampled, 88% (947) of total participants sampled were females. Of these 380 persons, 53.8% (206) were males with mean age of 33.6 ± 10.3 years.

#### Prevalence by age and sex.

It varied among different age groups in all the LGAs, highest prevalence 14.8% (79/533) was recorded among respondents within the age 25–34 years. The other age groups appeared to have had the same trend in prevalence except respondents in age class 1–4 which recorded the lowest 3.2% (45/1328). (Table 2).

#### ELISA of the 589 participants, 103 (17.3%) and 213 (35.8%) were anti-IgG and ELISA positive respectively, while 91(15%) tested positive for both ELISA and RDT, and with significant difference (P<0.001).

#### Assessing RDT to ELISA, sensitivity and specificity were calculated to be 72.0% and 95.2% respectively (Table 2).

#### Discussion

1. **Sero-prevalence rate was higher in females than male participants.** This may be due to women more actively engaged in labour-intensive farming activities, thereby being exposed to vector biting more, which may increase the risk of infection.

2. **Among the different age classifications, it was observed that the value of sero-prevalence recorded among children within the age 5-14 years was considerably low.** The sero-prevalence observed among children is expected since they belong to age class that coincides with treatment history of net use in the state. It is believed that there won’t be a decrease of active transmission among this age, it is also in agreement with studies by Richards et al., (2001).

3. **The ability of ELISA test to pick up sero-prevalence rate supported the usefulness of the diagnostic test kit.**

4. **The RDT revealed the generally low prevalence of onchocerciasis in Ogun State and also provided a guide to areas where concerted effort in intervention is urgently required to sustain progress made.**

5. **It also revealed that the RDT had a good measure of sensitivity and specificity in association to the reference ELISA.**

6. **It promotes the IgG RDT to be a suitable and convenient diagnostic tool for the spot assessment of onchocerciasis.**

**Materials & Methods**

**Introduction**

Onchocerciasis, an invertebrate blinding disease of infection of Ochocerca volvulus transmitted by Simulium species. A African disease found in some parts of Africa, American, West Africa, and some parts of the African Peninsula.

**African Programme for Onchocerciasis Control have been successful in the implementation of Mass Drug Administration (MDA).**

**Nigeria is the only country with high disease burden of 300 million biting cases year.** (Mabiy et al., 2007, Norma et al., 2002).

**Prevalence and skin biopsy:**

Diagnosis relies on the use of skin biopsy to detect microfilaria in the subcutaneous area of the upper tibia crest of a study population.

**Onchocerciasis skin biopsy:**

Using dermatology instruments, information of onchodermatitis was obtained from patients within the age group 5 and above. Both male and female of 5 years old and above of all ethnic groups residing in frontline communities were examined according to standard protocol (WHO, 2003).

**Rapid Diagnostic Test (RDT) using Alere™ SD BioLine IgG test kit**

• Sero-discordant participants were enrolled for the onchocerciasis RDT test. Selection of participants were systematically done for validation of the Ov diagnostic test. Frontline communities with population around 200 were selected (WHO/COI guidelines for the study).

**Spots discrepancy**

• Serum DBS was diluted in 200uL 1/2 PBST + 2% milk. • Antigen concentration is prepared at 5pJ/ml. • Antigen coating buffer of 1X PBS is used.

**Blocking buffer 1X PBS + 5% FBS**

• Incubation temperature 37°C • Primary Antibody Mouse anti-human IgG • Primary antibody diluent PBST + 5% FBS.

• Secondary antibody: HRP conjugated anti-IgG- antibody (1:1000). • Color developer: 3,3’-5,5’-TMB.