LAGOS STATE UNIVERSITY 5TH FACULTY OF SCIENCE (LASU FOSC) CONFERENCE, 2017

ORAL PRESENTATION

CO-INFECTION OF EPSTEIN-BARR VIRUS, HERPES SIMPLEX VIRUS TYPES- 1 AND 2 IN PATIENTS WITH AND WITHOUT SEXUALLY TRANSMITTED DISEASES IN LAGOS, NIGERIA

Anjorin, AbdulAzeez. A. [1], Oyefolu, Akeeb. O. B. [1], Salu, Olumuyiwa. B. [2], Akinyemi, Kabir. O. [1], Omilabu, Sunday. A. [2]*

[1] Department of Microbiology, Lagos State University, Ojo, Lagos, Nigeria.

[2] Department of Medical Microbiology and Parasitology, College of Medicine, University of Lagos, Idi-Araba, Lagos, Nigeria.

**Correspondence: abdul-azeez.anjorin@lasu.edu.ng, +234 8020956357.*

INTRODUCTION

- Epstein-Barr virus (EBV), Herpes Simplex Virus (HSV) types-1 and 2 are ubiquitous and contagious, oncogenic, creeping DNA viruses (WHO, 2016).
  - in the family Herpesviridae.
- They establish lifelong latency in human causing acute and chronic severe diseases.
- According to the WHO, 2017, HSV-2 alone affects 356 million people globally, causing oral and genital diseases
  - while EBV causes infectious mononucleosis (Looker *et al.,* 2012; WHO, 2017).

INTRODUCTION

Etymology (Greek *Herpes*- Creeping).

There are 8 *Herpes Viruses* (HHVs) *in that family infecting Human*:

- ❑HHV- 1 (Herpes Simplex Virus 1)
- ❑HHV- 2 (Herpes Simplex Virus 2)
- ❑HHV- 3 (Varicella Zoster Virus)
- ❑HHV- 4 (Epstein- Barr Virus)
- ❑HHV- 5 (Cytomegalovirus)
- ❑HHV- 6 (Herpes Lymphotropic Virus)
- ❑HHV- 7 (Human Herpes Virus 7)
- ❑HHV- 8 (Kaposi)

INTRODUCTION

INTRODUCTION

- Herpesviruses are the most common viruses in humans infecting 80–90% of the global population (Slots, 2009).

- Infections in Africa and other developing areas are characterised by primary exposure in early childhood.
  - Due to certain cultural practices, than in the developed countries (WHO, 2016).

- While the exact status of EBV is usually determined by specific markers against viral capsid antigen (VCA),
  - transmission of EBV and HSV pose both economic and public health risks (Kriebs *et al.,* 2008).

STATEMENT OF PROBLEM

- The major problem is that EBV and HSV shares common transmission pattern of intimate contact with the fluid of an infected person (Bowden *et al*., 2006).

- EBV and HSV infections and/ co infections pose both economical and public health risk, genital HSV is dangerous to neonate and women at child bearing age.

- Unfortunately, there is dearth of epidemiological data on EBV, HSV and their co-infection in Nigeria.

AIM OF STUDY

- Therefore, this study was instituted to investigate IgM marker to EBV, HSV-1 and 2 and their co-infection in patients.

METHODOLOGY

- **STUDY DESIGN, SAMPLE SIZE, LOCATION, PERIOD AND APPROVAL**

- We designed hospital-based, basic, cross-sectional study, based on the sample size bearing in mind estimation method:
  - $N= Z^2 p (1 - p)/ d^2$, first developed by Kish, Leslie in 1965 where Z= reliability coefficient= 1.96 at 95% confidence interval.
- in order to generate epidemiological data for future prospective sentinel surveillance.

- This study was carried out among patients attending 5 public health institutions (Agbado-Ijaye, Ebute-Metta, Ikorodu, Ikotun and Surulere) in Lagos.
  - Between June and October, 2016.
  - Ethical approval was obtained from CMUL/ LSMH while all patients consented.

METHODOLOGY

- **STATISTICAL ANALYSES**

- Socio-demographic distribution of patients were computed with Microsoft excel sheet using Windows 2013.
    - Based on patients demographics on marital status, all patients were grouped into 3, as either single, married or divorce.

- Chi-square and Fisher's exact tests were used to calculate P-values for comparable epidemiological parameters using Graphpad 5.0, San Diego, USA.
    - Level of significance was tested at 95% CI.

- A total of 90 blood samples were collected by venepuncture from patients
    - with and without sexually transmitted diseases.

METHODOLOGY

- **LABORATORY ANALYSES**

- The assay was performed at the Virology Research Laboratory, Department of Microbiology, Lagos State University
    - under a locally designed Biological Safety Cabinet.

- The samples were analysed for IgM specific markers against
    - EBV-VCA
    - HSV-1 and 2
        - Using Enzyme Immunoassay (Dia.pro, Italy).

- Analysis was carried out following the manufacturer's procedure. Briefly (figure i),

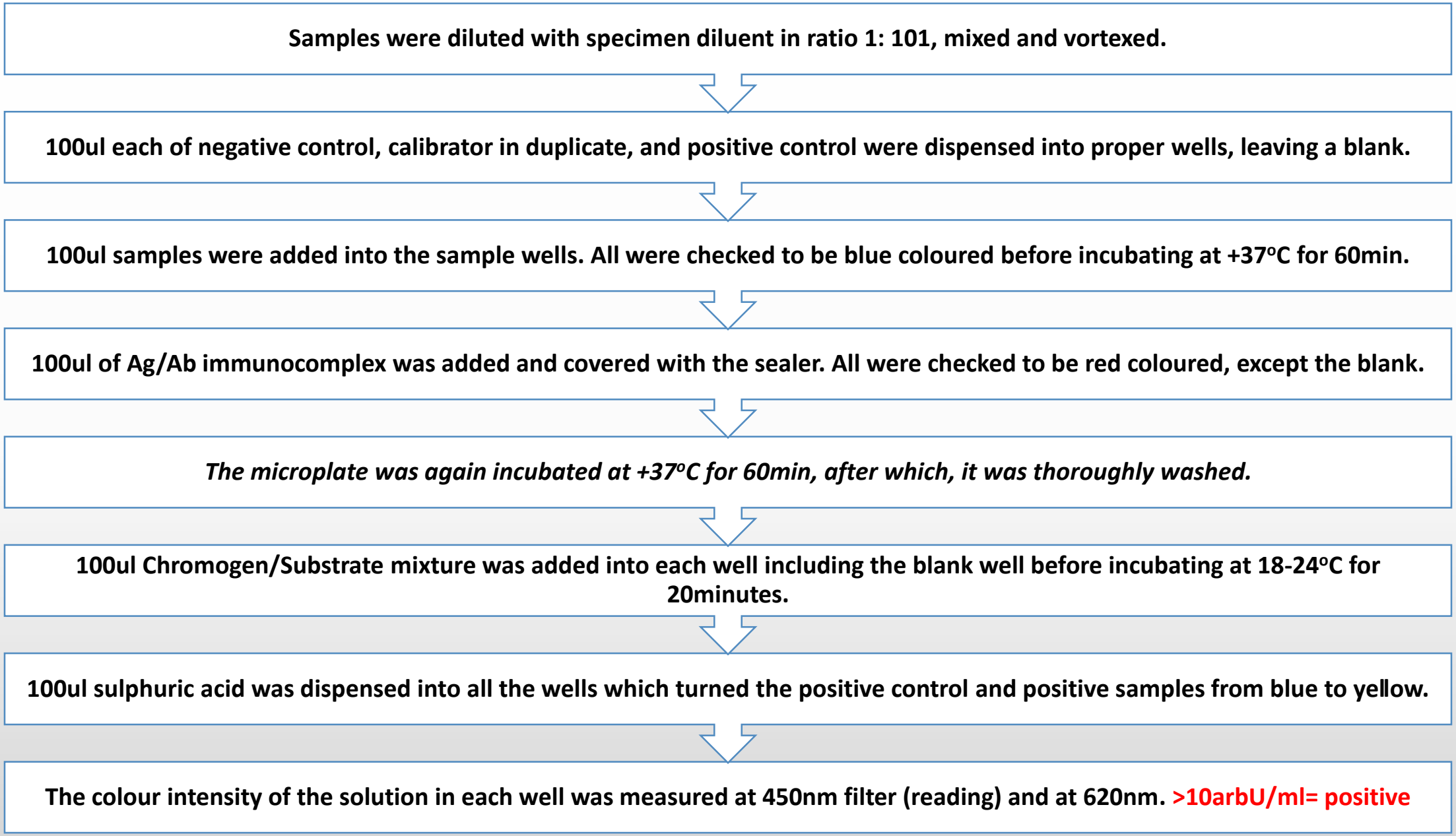

Figure i: Laboratory Analyses

RESULTS

- The demographic characteristics of the patients showed mean age of patients to be 31.5 years (median age, 30 years; range 18-50 years)
    - including 28 males and 62 females, giving female preponderance with male: female ratio of 1 : 2.21.
    -
- The most prominent age group was 21- 30 years with 41 (45.6%) number of patients recruited.

RESULTS

- The results revealed that 51 (56.7%) of the patients were positive for EBV, HSV-1 and 2, comprising of:
  - 34 (37.8%) to EBV,
  - 12 (13.3%) to HSV-1 and 2, and
  - remarkable co-infection of EBV, HSV-1 and 2 detected in 5 (5.6%) of the patients.
- Statistical testing showed a significant difference ($p<0.05$) between EBV, HSV-1 and HSV-2 seropositivity.
- Fifty (50) percent of the individuals positive to HSV types-1 and 2 had a common clinical manifestation of painful urination.

RESULT…1

EPIDEMIOLOGICAL DATA ON VIRAL AETIOLOGIES, CO-INFECTION AND SEX PARAMETER

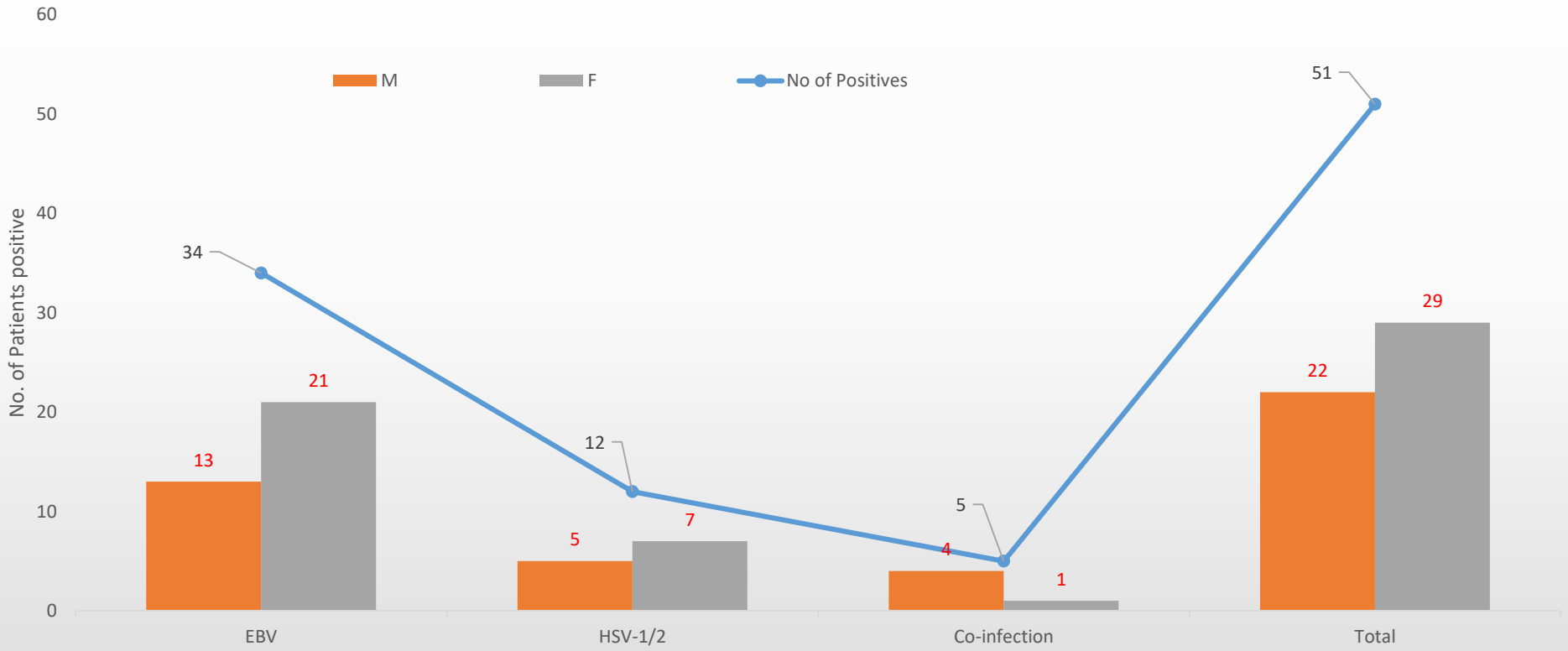

Fig 1: Co-infection and sex distribution to EBV, HSV-1/2

RESULTS…2

EPIDEMIOLOGICAL DATA ON VIRAL CO-INFECTION AND MARRITAL STATUS

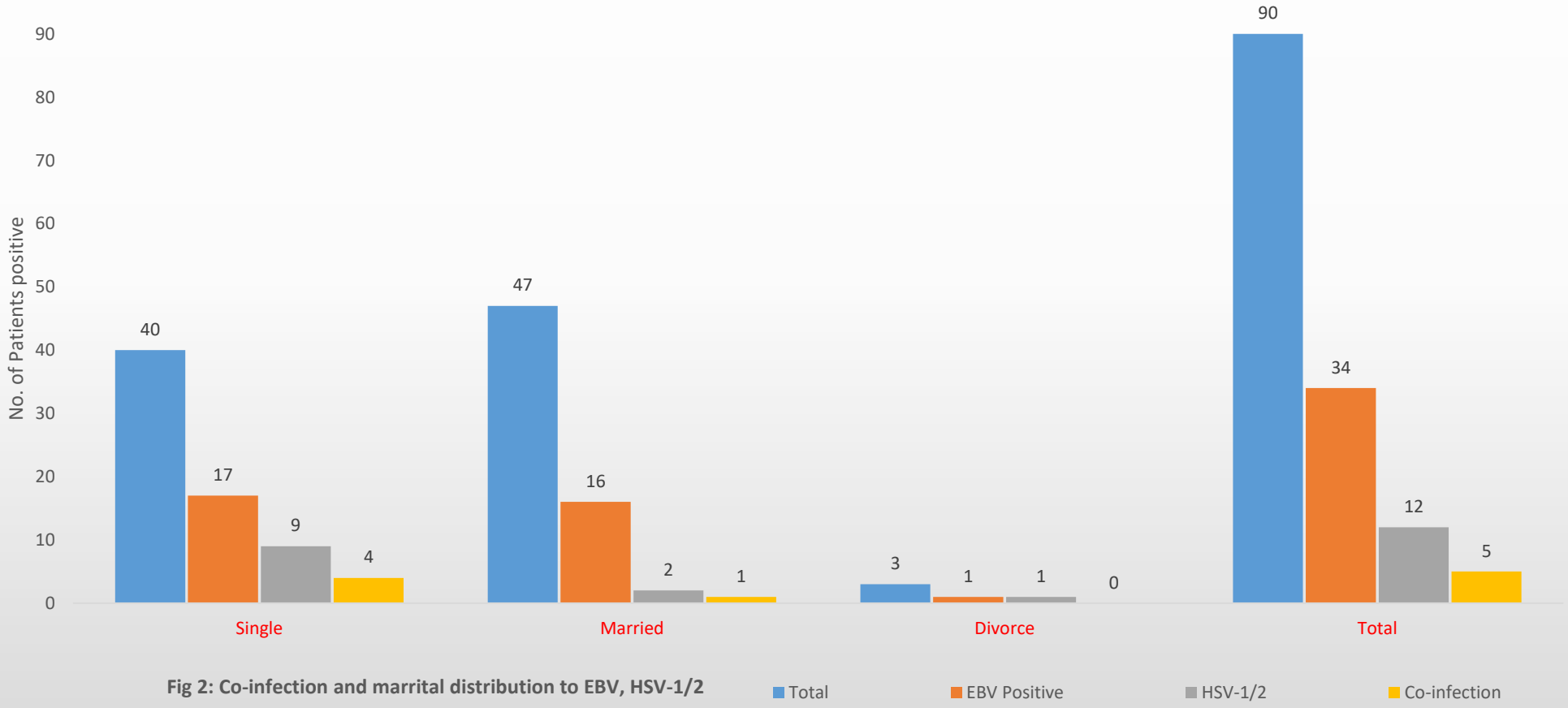

Fig 2: Co-infection and marrital distribution to EBV, HSV-1/2

RESULTS...3

EPIDEMIOLOGICAL DATA ON VIRAL CO-INFECTION AND AGE CLASSICAL INTERVAL

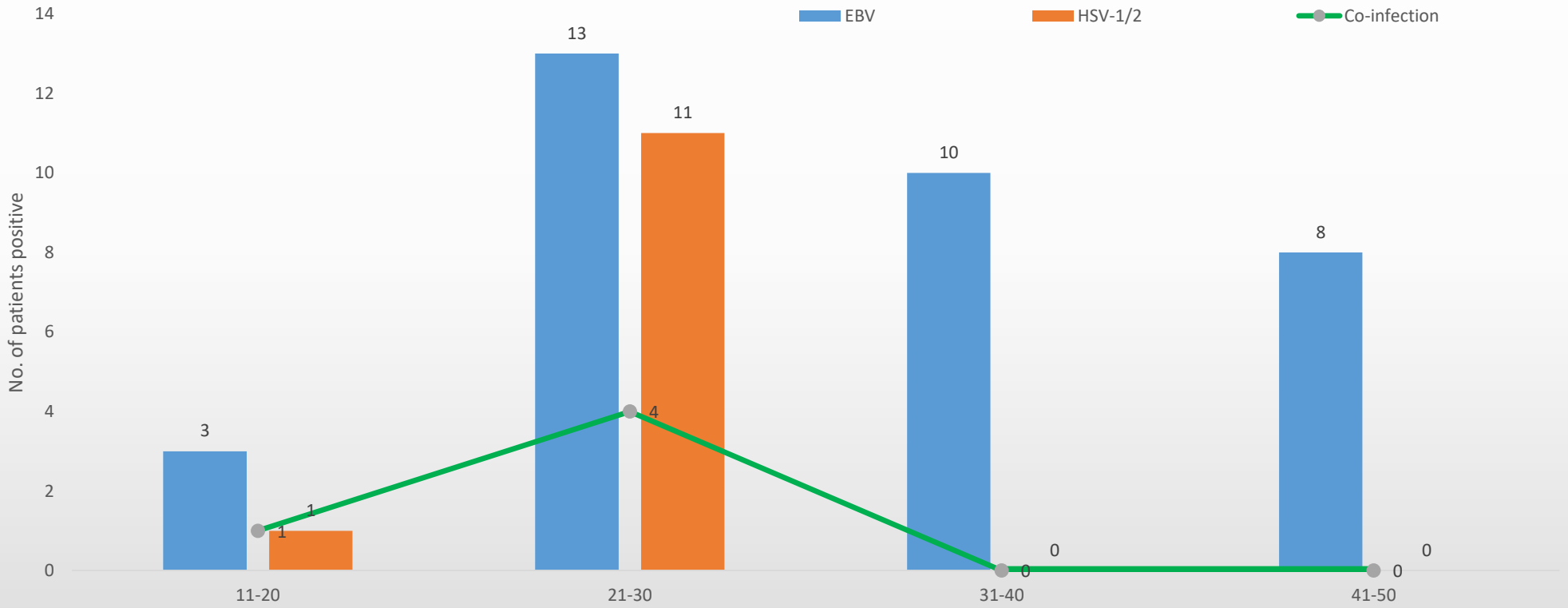

Fig 3: Co-infection with Age distribution to EBV, HSV-1/2

RESULTS...4

EPIDEMIOLOGICAL DATA ON VIRAL CO-INFECTION AND PATIENTS CLINICAL PRESENTATIONS

Table 1: Clinical Signs and symptoms observed in seropositive patients to EBV, HSV-1/2 in Lagos, Nigeria					
Signs/ Symptoms	No. of cases	EBV pos.	HSV-1/2 pos.	Total pos.	Co-infection
Blister	18	4	2	6	1
Painful urination	16	12	6	18	3
Sensation/Itching	19	7	1	8	-
Vaginal discharge	8	3	2	5	-
Rashes	8	4	0	4	-
Painful groin	5	2	1	3	1
Others	14	2	0	2	-
Total	94	34	12	46	5

DISCUSSION

- Again, EBV and HSV types 1 and 2 are viruses of serious public health importance. Unfortunately, there is rarity of information in Nigeria on this menace.

- The finding of 51 (56.7%) seropositivity to EBV, HSV-1 and 2 calls for serious concern.

- 37.8% (n=34) to EBV with a wide variation to 7.7% (n= 5) in Amazon, Brazil reported by Guimarães et al., 2012.

  - But this is comparable to studies in 8 other countries in Africa and other continents with
    - 75% (n= 15) in Sudan; 40% (n= 8) in USA; 80% (n= 16) in UK;
    - 71% (n= 12) in Sweden; 70% (n= 14) in Norway; 45% (n= 9) in India;
    - 35% (n= 7) in Sri Lanka; and 22% (n= 4) in Yemen.
  - Sample type and detection method and other factors may however contribute to the differences.

DISCUSSION

- We reported a monotypic infection of HSV-1/2, 13.3% (n= 12).

- This is higher than that of previous study by Oke *et al*. (2012) on HSV-2 in the same location of Lagos that reported a prevalence rate of 9.7%.

  - It shows an increment of approximately 4% in the prevalence rate within 4 years with a given annual increment of 1% which is worrisome.

  - Elsewhere in Nigeria, Abdulfatai *et al*. (2013), reported that 99.2% of people living in Kaduna metropolis had past infection against HSV-1

  - Okonko and Tochi (2015) showed that 99.4% of the pregnant women attending antenatal clinic were seropositive for HSV-1 IgG.

DISCUSSION

- In other countries, in Amazon, Brazil, Guimarães et al., 2012 reported HSV-1, 7.7% ; HSV-2, 16.9% (n= 11).
    - In Sudan, 15% (n= 5) was reported by Jalouli *et al.,* 2012.
    - Also, in developed countries, 55% (n= 11) in Sweden; 12% (n= 2) in Norway; and 20% (n= 4) in the UK.
    - While in developing countries, 10% (n= 2) was reported in Sri Lanka; and 11% (n= 2) in Yemen.

DISCUSSION

- Co-infection causes more severe and debilitating effects thereby compounding the health status of the individuals.
    - Notably for haematologic abnormalities: mononucleosis, thrombocytopaenia and anaemia.
- Remarkable co-infection of EBV, HSV-1 and 2 was detected in 5.6% (n=5) of patients.
    - This result is higher than that of the study by Sinniah *et al*., 1993 that reported 1 co-infection in Singaporean and British patients.
    - But much lower than that of Rodrigues *et al* (2010) who reported a prevalence of HSV and EBV of over 30%.

DISCUSSION

- Also, previous studies by Jalouli *et al.,* 2012 reported co-infection of EBV and HSV of:
  - 30% (n= 6) in the UK;
  - 12% (n= 2) in Sweden; and
  - 15% (n= 3) in Norway.

CONCLUSION

- This study bared recent infection of EBV, HSV-1 and 2, and their co-circulation in patients which may further worsen the disease state of the individuals especially in those having sexually transmitted diseases.

- We therefore recommend routine screening of these viruses in our public health centres.

LAGOS STATE UNIVERSITY 5TH FACULTY OF SCIENCE (LASU FOSC) CONFERENCE, 2017