

Genital tract abnormalities among female sex workers who douche with lemon/lime juice in Nigeria



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Introduction 1

- **Vaginal douching for sex is widespread among women of diverse cultures worldwide**
- **Commercial antiseptics, soap with water and salty water are commonly used agents**



Introduction 2

- Vaginal douching with lime juice:
 - Was reported over 300 years ago
 - Still a common practice among female sex workers (FSWs) in Nigeria
- Krest bitter lemon (soft drink) and lime juice have antimicrobial and spermicidal properties
- Even suggested as candidate microbicide

Introduction 3



- Cytotoxicity of lemon/lime juice on cervical explant tissue similar to N-9. (Lackman-Smith et al)
- lime juice caused dose-dependent epithelial damage to the cervix and vagina.
- In primates, daily intra-vaginal administration of undiluted lime juice (pH 2.5) for one month does not appear to damage cervical or vaginal epithelium.

Introduction 4



- Lysol and other tar-based vaginal douche products showed significant association with cervical cancer
- Does lemon/lime vaginal douching for sex have any impact on lower genital tract epithelium?



Study Design and Subjects 1

- Cross-sectional study of existing users
- Advocacy and mobilization
- Consenting brothel-based FSWs recruited in Jos, Nigeria
- This study was approved by the ethical review board of Jos Univ. Teaching Hospital



Study Design and Subjects 2

- Study questionnaire to gather information on vaginal practices administered
- Gynaecologist who was blinded to the women's responses obtained Pap smears and performed colposcopy of the vulva, vagina and cervix.
- Abnormalities were treated free of charge



Clinical Procedure

- Colposcopy of the vulva
- Naked eye examination of the cervix, fornices, and vaginal walls
- Pap Smear
- Lavage (3% Acetic acid) and colposcopy examination of these areas
- Sampling as appropriate.



Statistical Analysis

- Data entry and analysis were done using Epi info version 3.3.2
- Odds ratios with 95% CI and Chi square (χ^2) test used to test associations
- Multivariate logistic regression used to assess the independent effect of lemon/lime use on the risk of cervical dysplasia.
- A p-value ≤ 0.05 was considered significant.



Results

- 398 subjects consented to participate in this study and completed questionnaires
- 24 did not return for colposcopy
- 374 FSWs: 81 Lemon users (LUs) and 293 non-lemon users (NLUs) were recruited and examined.



Results

- **Mean Age \pm SD (Range) Years:**

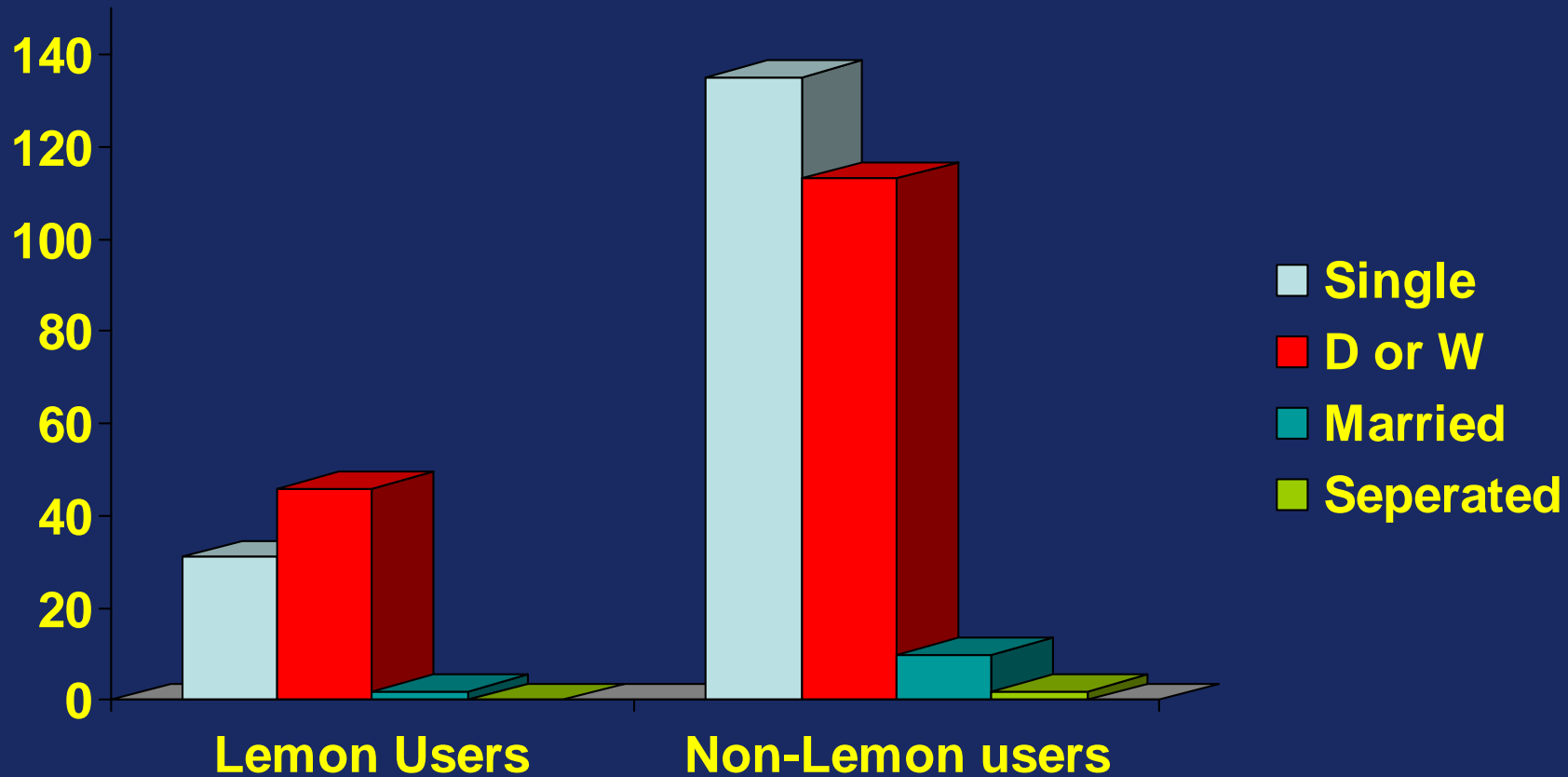
LUs 28.0 \pm 7.7 (18-54)

NLUs 27.4 \pm 6.8 (16-63)

- **Religion**

	Christian	Muslim
LUs	80/84 (95.2)	4/84 (4.8)
NLUs	290/308 (94.2)	18/308 (5.8)

MARITAL STATUS OF FEMALE SEX WORKERS IN JOS, NIGERIA



DURATION OF SEX WORK AND LEMON/LIME USE

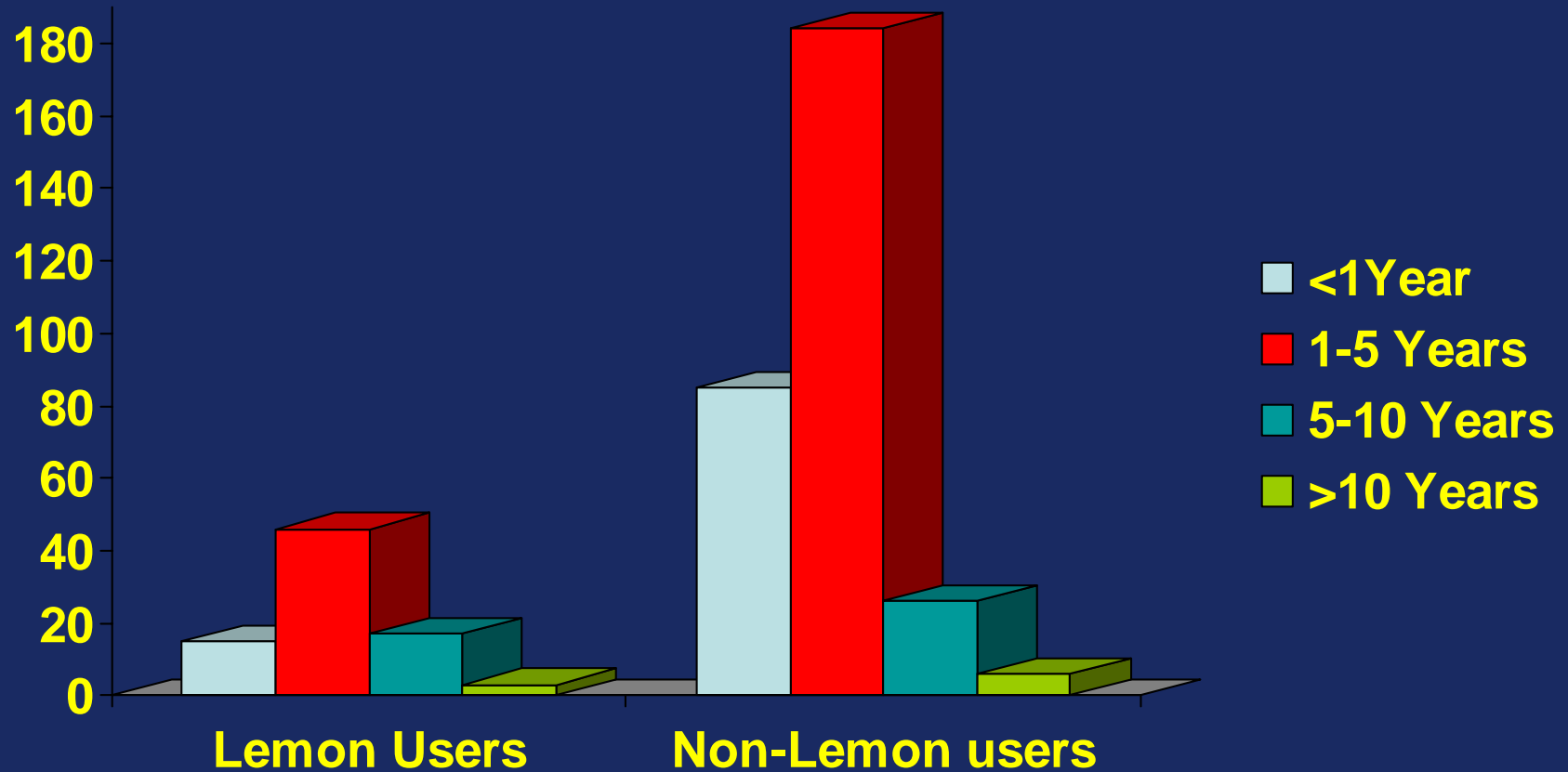


Table 1: COLPOSCOPY FINDINGS AMONG FSWS IN NIGERIA

	Lime Users	Non-Lime Users	OR (95% CI)	p value
Colposcopy	n=81 (%)	n=293 (%)		
Normal	50 (61.7)	190 (64.8)		
Cervicitis	13(16.0)	52 (17.7)	0.89 (0.43-1.80)	0.721
*Warts	5(6.1)	12 (4.1)	1.54 (0.46-4.90)	0.427
Suspected SILs	17 (20.9)	44 (15.0)	1.50 (0.77-2.92)	0.198

* Warts frequently involved the cervix, vagina and vulva.

Table 2: CERVICAL CYTOLOGY FINDINGS AMONG FSWS IN NIGERIA

	Lime Users	Non-Lime Users	OR (95% CI)	p value
Cytology	n=78 (%)	n=276 (%)		
Normal	48 (61.5)	193 (69.9)		
ASCUS	4 (5.2)	22 (8.0)	0.73 (0.18-7.30)	0.579
LSIL	10 (12.8)	30 (10.9)	1.38 (0.56-3.12)	0.417
HSIL	16 (20.5)	31 (11.2)	2.13 (1.03-4.40)	0.025
LSIL/HSIL	26 (33.3)	61 (22.1)	**1.76 (1.0-3.10)	0.042

**Adjusted for HIV status



Results (contd.)

- *HIV prevalence:*

LUs 48.8% vs. NLUs 48.2%

Odds Ratio 1.0; 95% CI 0.6-1.2, p=0.9427

(Imade et al 2007 IAS Poster TUPEC022)

Discussion



- There was a significantly higher prevalence of SILs among LUs in comparison to NLUs after confounding for HIV status .
- No difference in prevalence of cervicitis or genital warts between LUs and NLUs
- We found no evidence of abrasions or bruises.

Limitations of the study



- We relied on self reporting by subjects and have no means of verifying claims.
- We could not control for other factors like degree of dilution of lime juice, timing of douching and frequency of condom use.
- Because of the cross-sectional nature of the study, we cannot be confident that use of lime juice preceded the development of cervical dysplasia.
- Confounding by association may have arisen if use of lime juice is associated with other practices that increase the risk of cervical dysplasia.

Conclusions



- **The practice of douching with citrus juice may be a risk factor for cervical dysplasia.**
- **Further studies to explore the association between douching with lime juice and cervical dysplasia are warranted in communities where this practice is common.**

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