Hepatitis C Virus multiple genotype infection

د.ابتسام البوشي **مشفى دمشق**

حالة سريرية

المريضة : **ن.ر** العمر : **45 سنة** الحالة الإجتماعية: **متزوجة** السكن : **درعا** *

: سوابق مرضية *ESRD **معالجة بالتحال الدموي**

مخبريا عند بدء التحال *ALT: **N** AST: **N** Anti-HCV : **Neg**

عند اجراء مراقبة روتينية بعد 3 أشهر من بدء التحال الدموي *

أجري للمريضة * Anti-HCV وكان **إيجابي**
أجري للمريضة * Pcr-HCVوكان **ايجابي**
أجري للمريضة *Genotype-HCVوكان من النمطين(**1 - 4**)

Detection, genotyping and the RNA-HCV viral load

- **The viral RNA was extracted from 200 ul sample of plasma using Roche MagNA pure (automated extraction).**

- **RNA sample were tested with negative control on Roter-Gene machine using Sacace Real Time HCV genotype.**

Epidemiol. Infect. (2009), **137**, 79–84. © 2008 Cambridge University Press
doi:10.1017/S095026880800054X Printed in the United Kingdom

The unexpected discovery of a focus of hepatitis C virus genotype 5 in a Syrian province

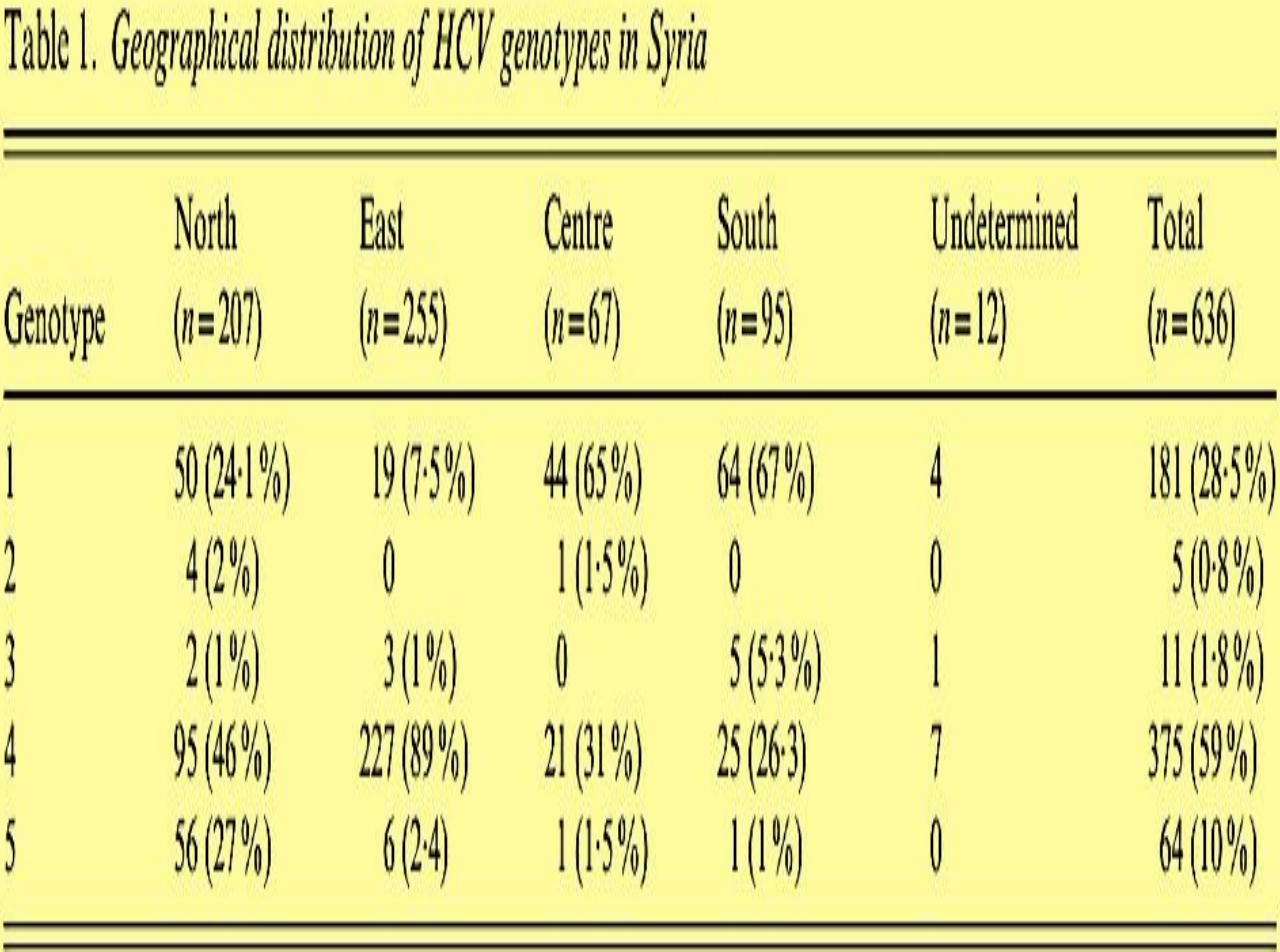
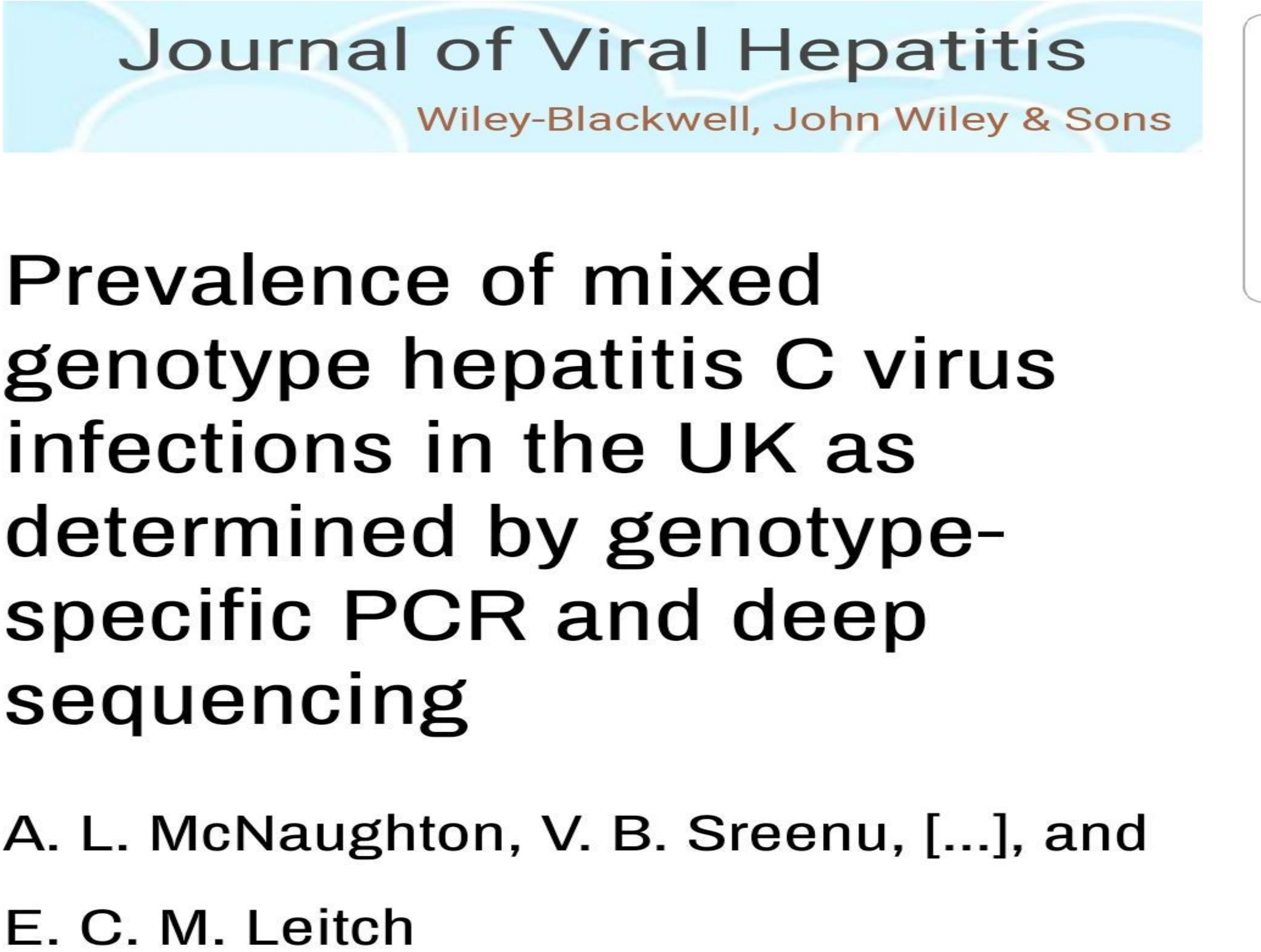


Table 1. *Geographical distribution of HCV genotypes in Syria*

Genotype	North (*n* = 207)	East (*n* = 255)	Centre (*n* = 67)	South (*n* = 95)	Undetermined (*n* = 12)	Total (*n* = 636)
1	50 (24·1%)	19 (7·5%)	44 (65%)	64 (67%)	4	181 (28·5%)
2	4 (2%)	0	1 (1·5%)	0	0	5 (0·8%)
3	2 (1%)	3 (1%)	0	5 (5·3%)	1	11 (1·8%)
4	95 (46%)	227 (89%)	21 (31%)	25 (26·3	7	375 (59%)
5	56 (27%)	6 (2·4)	1 (1·5%)	1 (1%)	0	64 (10%)



Journal of Viral Hepatitis
Wiley-Blackwell, John Wiley & Sons

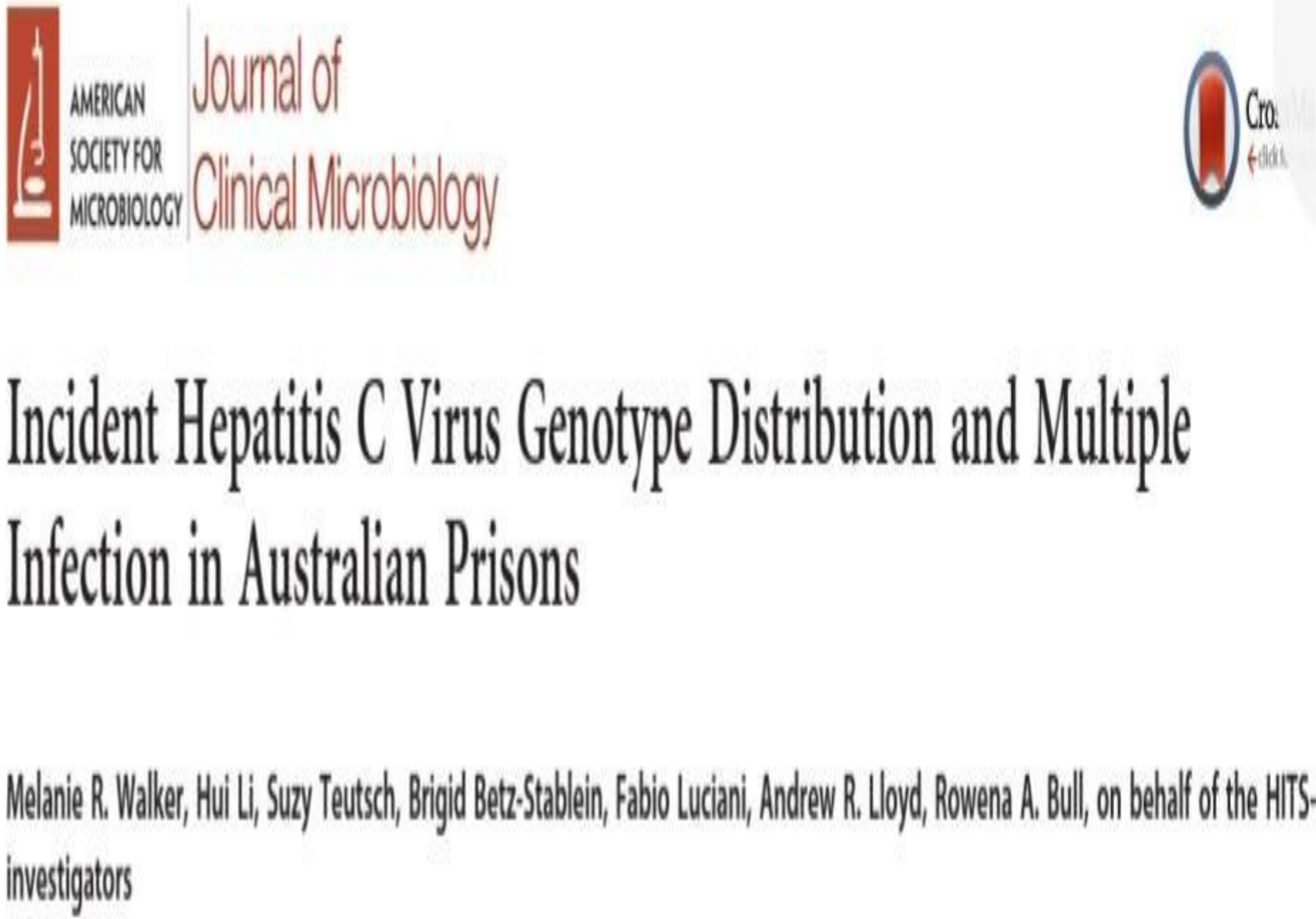
Prevalence of mixed genotype hepatitis C virus infections in the UK as determined by genotype-specific PCR and deep sequencing

A. L. McNaughton, V. B. Sreenu, [...], and E. C. M. Leitch

Mixed HCV infection in UK

- **The prevalence rate of mixed infection in the UK cohort of 506 individuals by PCR was 3.8%, with genotype 3 as the major genotype.**

- **The mixed infection rate obtained from PCR-NGS data was much higher.**



AMERICAN SOCIETY FOR MICROBIOLOGY
Journal of Clinical Microbiology

Incident Hepatitis C Virus Genotype Distribution and Multiple Infection in Australian Prisons

Melanie R. Walker, Hui Li, Suzy Teutsch, Brigid Betz-Stablein, Fabio Luciani, Andrew R. Lloyd, Rowena A. Bull, on behalf of the HITS-investigators

In Australia

- **Most common genotype is 3.**

- **Multiple genotype infection is common in high-risk populations.**

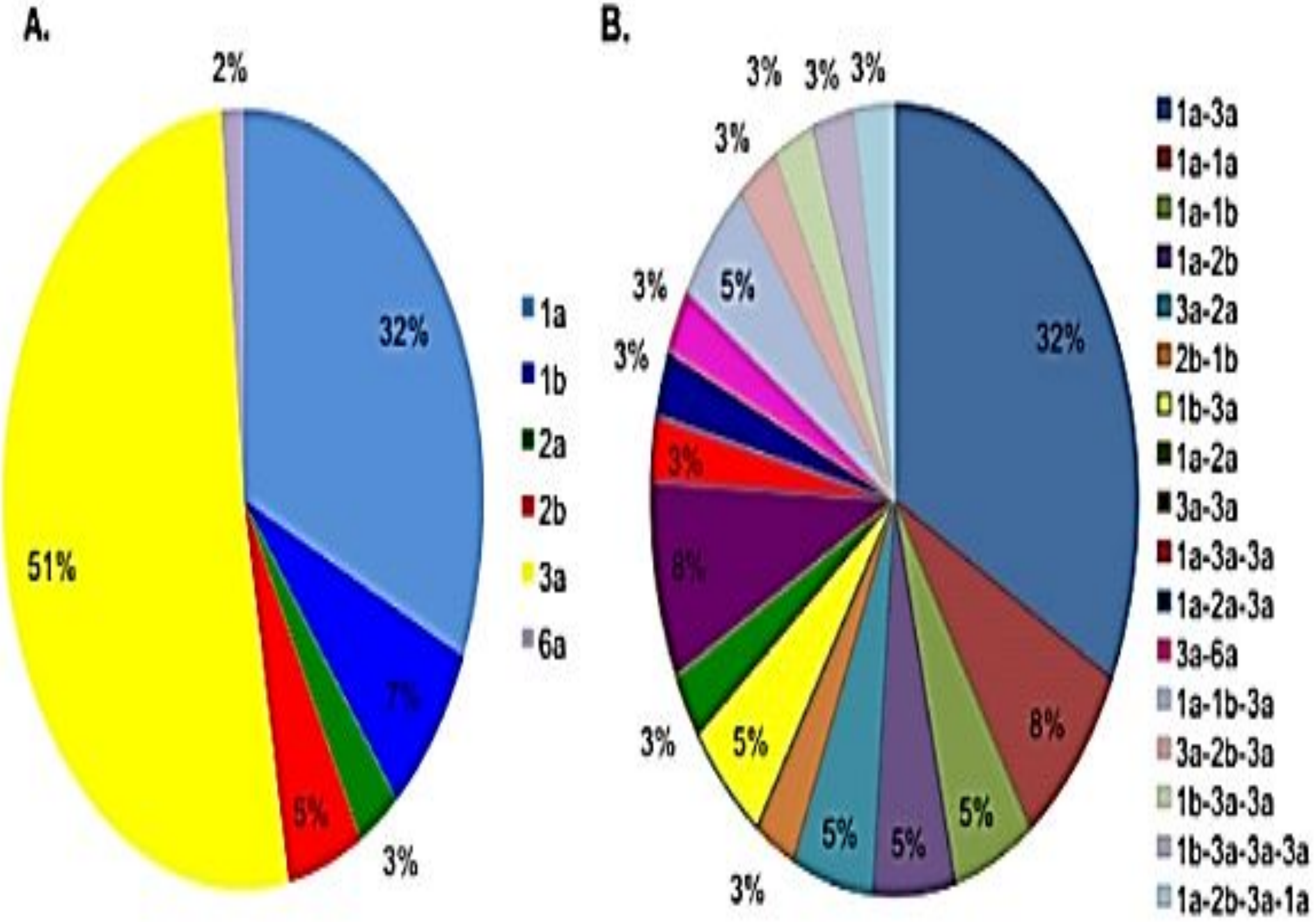


FIG 1 Distribution of HCV subtypes and multiple-infection combinations. (A) Distribution of subtypes in the primary incident HCV infection samples in the cohort, with different subtypes represented by different colors as shown in the key. (B) A varied set of multiple-infection combinations were observed. Each multiple-infection combination is represented by a different color as shown in the key, with the percentage of each set as a proportion of the total also represented.

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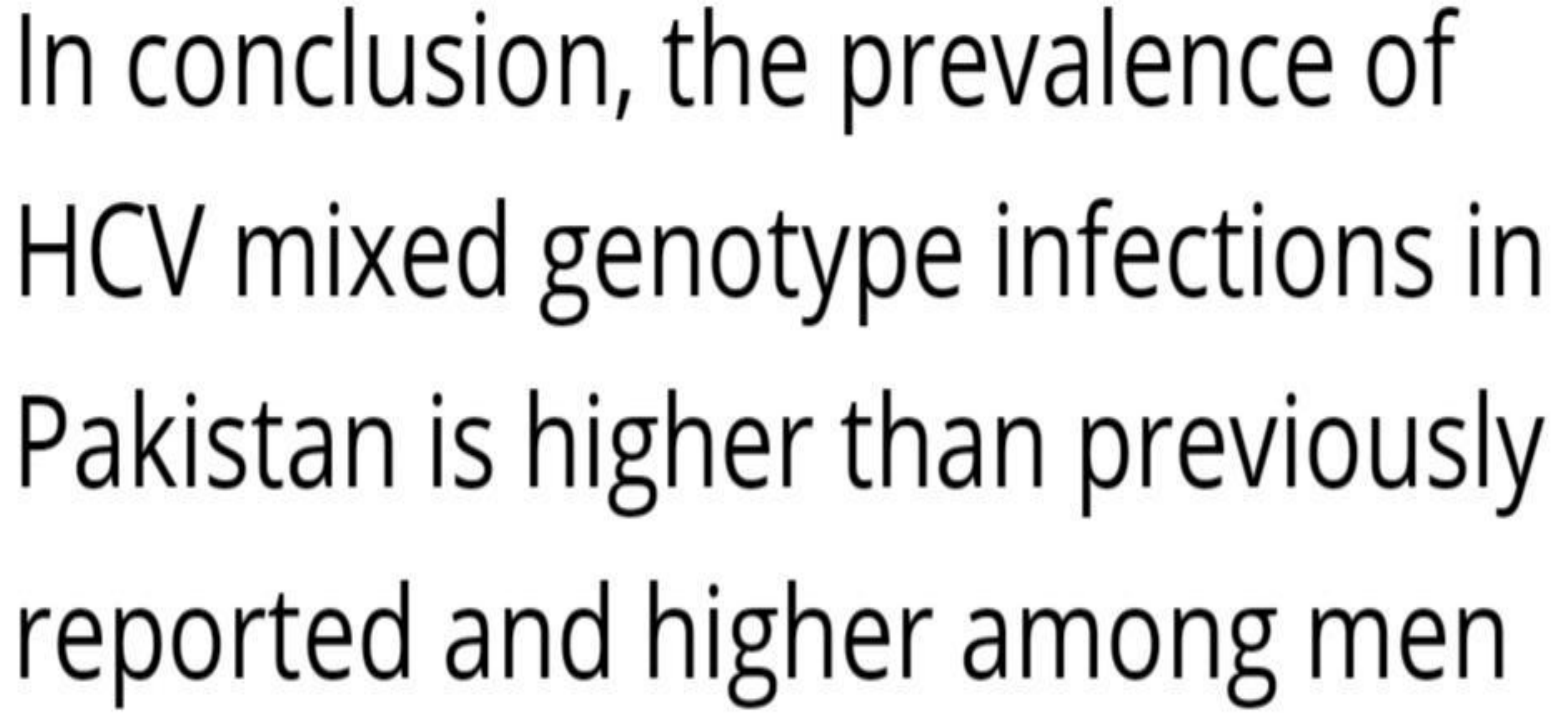
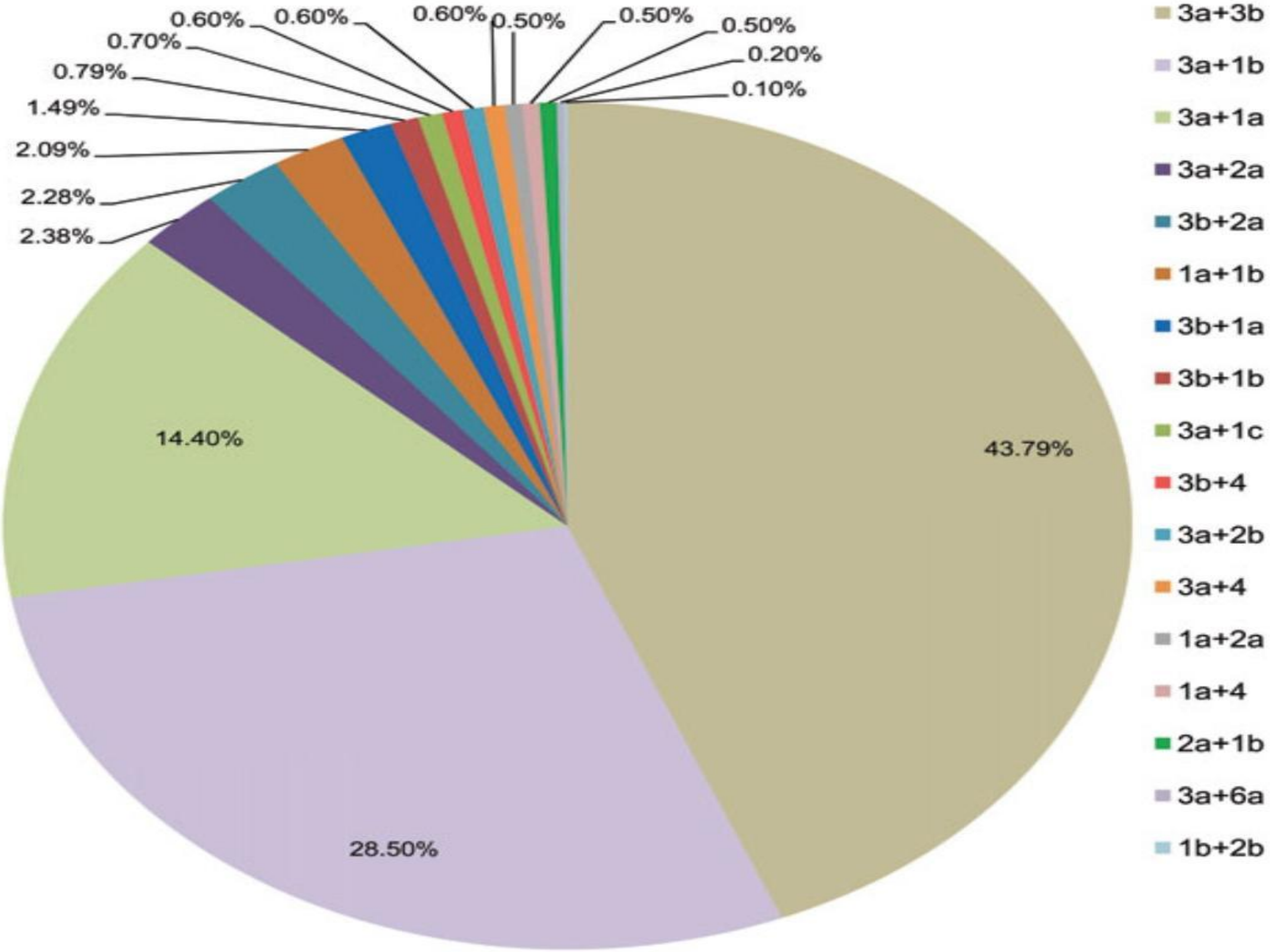
Letter

Mixed Genotype Infections with Hepatitis C Virus, Pakistan

Sadia Butt, Muhammad Idrees✉ , Irshad Ur Rehman, Haji Akbar, Muhammad Shahid, Samia Afzal, Saima Younas, and Iram Amin
Author affiliations: Author affiliation: University of the Punjab, Lahore, Pakistan



In conclusion, the prevalence of HCV mixed genotype infections in Pakistan is higher than previously reported and higher among men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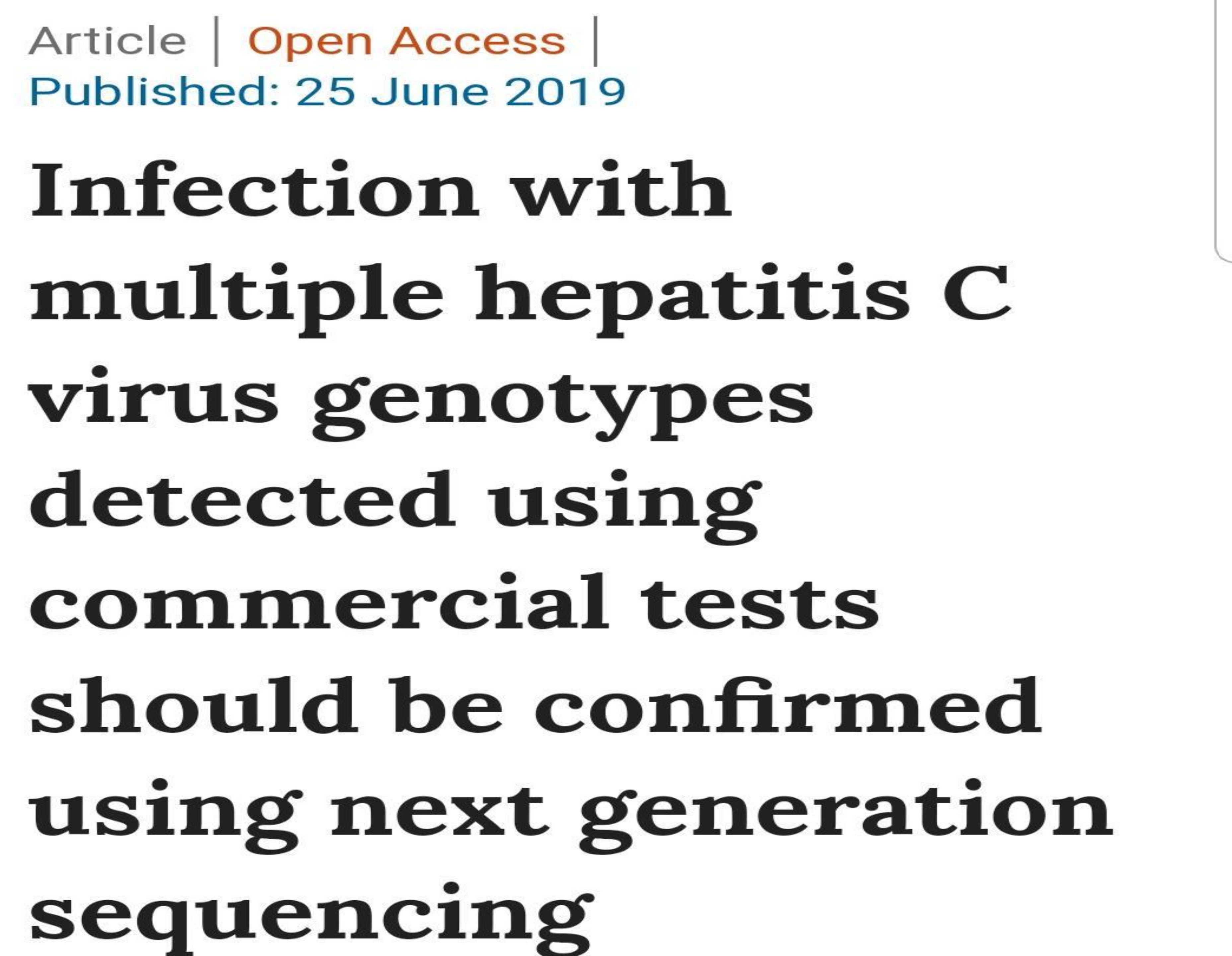
0.20%
0.79%
0.10%
1.49%
2.09%
2.28%
2.38%
14.40%
43.79%
28.50%
3a+3b
3a+1b
3a+1a
3a+2a
3b+2a
1a+1b
3b+1a
3b+1b
3a+1c
3b+4
3a+2b
3a+4
1a+2a
1a+4
2a+1b
3a+6a
1b+2b

Why it's important to look for multi genotype HCV infection

- In patients serially infected by different HCV strains, one strain will prevail as the viremic virus .

- Under antiviral therapy, the displaced strain may influence the outcome of therapy.

- detection of inferior strains by serological assays before antiviral therapy may be important for choosing the adequate regimen.



Article | Open Access |

Published: 25 June 2019

Infection with multiple hepatitis C virus genotypes detected using commercial tests should be confirmed using next generation sequencing

- **HCV is a blood-borne pathogen, and transmission modes of the disease are parenteral and to a lesser extent sexual. and sharing toothbrushes/ razors.**

- **Patients in hemodialysis units have an increased risk for contracting HCV.**

- **The ESRD patients with one genotype HCV infection have a high risk of developing infection with another HCV genotype(super infection) from dialysis centers.**

- **There are many reasons associated with HCV transmission within a facility including: the dialysis machine may have a role , transfusion during dialysis, the duration of hemodialysis.**

- **Failure to clean and disinfection of equipment and environmental surfaces, adherence to hand hygiene and glove use, vascular access care, and medication preparation and administration.**

- **All ESRD patients on dialysis should be screened for anti-HCV antibodies at the time of admission to dialysis center.**

الجمهورية العربية السورية
وزارة الصحة
الهيئة العامة لمشفى دمشق
الشعبة الهضمية

مستودعات معتوق للأدوية
مكتب الدعاية (قسم أدوية التهاب الكبد)

رقم الاضبارة..............

الاسم: العمر: الجنس: ○ ذكر ○ أنثى المحافظة:

العنوان: رقم الهاتف: مدخن ○ ......باكيت / سنة كحولي ○ ......غ/يوم

الحالة الاجتماعية:

أعزب ○ متزوج ○ مطلق ○ أرمل ○

المستوى التعليمي:

أمي ○ تعليم أساسي ○ ثانوي ○ جامعي ○ فوق جامعي ○

تاريخ القبول: ....

سوابق علاجية: ....

Naïve ○

التحاليل المطلوبة:

التنميط الفيروسي

Genotype 1a ○ Genotype 1b ○ Genotype 2 ○ Genotype 3 ○
Genotype 4 ○ Genotype 5 ○ Genotype 6 ○ Other ○

خزعة الكبد..............

HBsAg.......... PCR.........unit Anti HBc Ag total..........

طرق انتقال العدوى :

مركز غسيل كلية ○ مكان الغسيل.........

تلاسيميا ○ أورام دم ○ أخرى ○

تاريخ ارسال المريض: ....

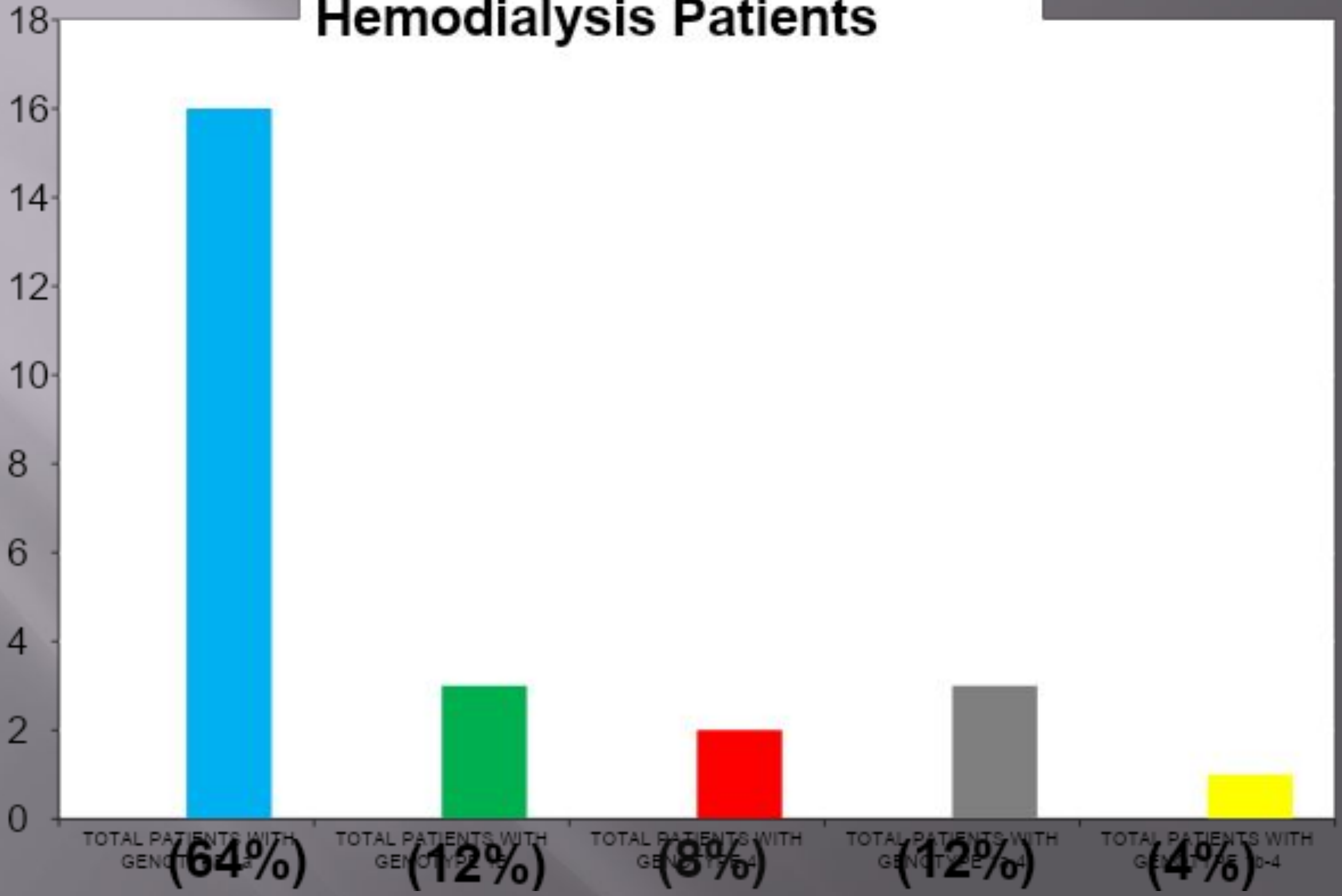
MDS

ختم الطبيب

Study in Damascus hospital

- We investigate the super infection with two genotypes Hepatitis C virus (HCV) infection in 25 patients with ESRD and found that 4 of 25 patients (16%) have two genotypes {genotypes 1a - 4 found in 3 patients (12%) and genotypes 1b - 4 found in one patient (4%)} from different dialysis centers around Syria.

The Incidence of HCV Among Hemodialysis Patients



- **Solutions to prevent transmission of HCV in dialysis facilities; adherence to recommended infection control and practicing are needed.**

- **training the dialysis staff routinely in a program for preventing infection, Follow CDC recommendations for HCV screening of hemodialysis patients.**

- **evaluate the facility routinely for infection.**

Conclusion

- We must do more researches in all around Syria to detect the multi genotype infection with HCV and to make precise percentage of the prevalence of all genotypes .

- We must use the NGS routinely in Syria if possible

- **Treat your patients with broad spectrum DAA .**

- **Follow CDC recommendations for HCV screening of hemodialysis patients.**


Thank You