North Clin Istanb 2025;12(1):151–152

Letter to the Editor

Cost utility analysis of using qualitative hepatitis C virus RNA assay for determining active infection with sufficient viral load for treatment

Amnuay Kleebayoon,[1] Sora Yasri,[2] Viroj Wiwanitkit[3,4]

[1]Private Academic Consultant, Samraong, Cambodia

[2]KMT Center, Bangkok, Thailand

[3]Research Center, Chandigarh University, Punjab, India

[4]Department of Biological Science, Joseph Ayo Babalola University, Ikeji-Arakeji, Nigeria

To the Editor,

Chronic infection with the hepatitis C virus (HCV) is an important major etiology of cirrhotic liver disease and hepatoma [1]. HCV is a prominent blood-borne infection. Globally, fifty-eight million cases have a chronic disease, and 1.5 million develop new infections each year [1]. The elimination of viral hepatitis by 2030 is a target set forth according to policies of WHO. Goals include a nine-tenth reduction in new infections, nine-tenths of patients with active infections being diagnosed, and eight-tenths of chronically infected individuals receiving treatment. The demanding prerequisites needed to obtain government-subsidized HCV treatment are a significant barrier to eliminating HCV in developing nations. In addition to the presence of positive antibodies, a quantitative HCV ribonucleic acid viral load of less than five thousand IU/mL, hepatic elastography, or a liver marker set are required. Patients with active hepatitis C are frequently discouraged by these out-of-pocket expenses from receiving timely care and treatment [1]. In almost all people with a viral load below the current treatment threshold of five thousand IU/mL, primary screening with rapid test for the antiviral antibody followed by qualitative ribonucleic acid determination helps detect active and chronic disease [2]. It may imply that qualitative HCV ribonucleic acid analysis can replace the more costly quantitative HCV viral load test, removing a major roadblock to disease eradication in a country with average middle-income status [2]. Based on publicly available data in Indochina [2], the authors reappraise and perform additional cost-utility analysis by using qualitative HCV ribonucleic acid assay for determining active infective pathological processes with a high enough viral load to warrant therapy. For analysis, the utility is referred from the locally available data as already noted. The cost is referred to the local national reference from the local Department of Medical Science and presented in USD. The costs for rapid diagnostic test and standard molecular test are 9 and 107 USD, respectively.

Table 1. Cost utility analysis comparing different alternative for screening

Alternatives	Cost (USD)	Utility (%)	Cost per utility (USD)
Screening by standard molecular test**	=107*100 =10,700	0.592	180.7
Screening by rapid diagnostic test followed by standard molecular test in positive cases***	=900+(107*6.2) =1,563.4	0.588	26.4

*: The analysis assumes 100 cases; **: For all cases, the cost will be the same as the cost of standard molecular test screening; ***: The cost will be equal to the cost of rapid diagnostic test screening for all cases plus the cost of additional standard molecular test screening for positive cases, with a chance of % based on the previous study (rate=6.2 %) [2].

For cost-utility analysis, the unit cost per unit utility is calculated as "cost per utility = cost/utility". From analysis (Table 1), the cost per utility for screening by rapid diagnostic test followed by standard molecular test in positive cases is significantly lower (about 6/84 times). As a result, it is possible to conclude that the strategy of rapid diagnostic test screening followed by standard molecular testing in positive cases is valid in terms of medical economics for determining active infective pathological process with a high enough viral load to warrant therapy. However, it should be noted that this analysis is not based on a diagnostic approach. Further evaluation of the impact of underdiagnosed case possibility in using rapid diagnostic test screening in terms of therapeutic cost for the missed/underdiagnosed case is required.

Cite this article as: *Kleebayoon A, Yasri S, Wiwanitkit V. Cost utility analysis of using qualitative hepatitis C virus RNA assay for determining active infection with sufficient viral load for treatment. North Clin Istanb 2025;12(1):151–152.*

Conflict of Interest: No conflict of interest was declared by the authors.

Use of AI for Writing Assistance: The authors declared that they did not use artificial intelligence (AI)– assisted technologies (such as Large Language Models [LLMs], chatbots, or image creators) in the production of submitted work.

Financial Disclosure: The authors declared that this study has received no financial support.

REFERENCES

1. Spearman CW, Dusheiko GM, Hellard M, Sonderup M. Hepatitis C. Lancet 2019;394:1451-66. [CrossRef]
2. Pratedrat P, Nilyanimit P, Wasitthankasem R, Posuwan N, Auphimai C, Hansoongnern P, et al. Qualitative hepatitis C virus RNA assay identifies active infection with sufficient viral load for treatment among Phetchabun residents in Thailand. PLoS One 2023;18:e0268728. [CrossRef]

Received: August 30, 2023 *Accepted:* November 28, 2023
Online: December 12, 2024

Correspondence: Amnuay KLEEBAYOON, MD.
Private Academic Consultant, Samraong, Cambodia.
Tel: +855 785 473 483 433 e-mail: dramnuaykleebayoon@gmail.com

doi: 10.14744/nci.2023.78972
Istanbul Provincial Directorate of Health - Available online at www.northclinist.com