

## LETTER to the EDITOR

**HCV, Interferon Therapy Response, Direct Acting Antiviral Therapy Revolution and Pakistan: Future Perspectives***Asian Pac J Cancer Prev*, **16** (13), 5583-5584**Dear Editor**

In this issue of APJCP, Akhtar and colleagues (16: 3; 2015) published an interesting report and highlights an important issue of interferon plus ribavirin therapy response against different HCV genotypes. The study included 3,800 HCV patients who were treated with interferon alfa-2a plus ribavirin for 6-months and were followed for therapy response. The results showed that 97% (3,677) patients showed sustained virological response (SVR) while 3% (123) patients were non-responders. In next round of therapy Peg-interferon and ribavirin was used to treat non-responders (123) and relapsed (5) patients for next 6 months, which resulted into elimination of HCV RNA from 86% of these patients. These results enlighten the future potential of interferon therapy usage in Pakistan in era of direct acting antiviral agents (DAA). DAA provide new opportunities for HCV treatment and resulted in increased SVR and avoids the side effects of interferon treatment. Several DAA including simeprevir, boceprevir, telaprevir, asunaprevir (NS3/4A inhibitor), daclatasvir (NS5A inhibitor), Sofosbuvir (NS5B polymerase inhibitor) showed promising results and resulted in shorten therapy duration (Gane, 2014). These DAA can be used in combination regimens with or without ribavirin. Although these combinations of DAA resulted in increased SVR but the cost is too high. For example, the cost of 12 and 24 week course of US-FDA approved sofosbuvir, an NS5B inhibitor is about \$84,000 and \$168,000 respectively (Amer et al., 2014) while 12 week therapy of simeprevir and sofosbuvir will cost \$150,000 (Gane, 2014).

Pakistan ranked second in the world in term of HCV burden with more than 10 million infections (Afzal et al., 2014 a,b). Pakistan is a resource constrained country with very low per capita income. The total expenditure on health is just 2.7% of GDP (WHO, 2012) and the endemics of dengue and polio virus also results in shifting of priorities. The results of recent studies showed that irrespective of the HCV genotype SVR rate of interferon alfa-2a plus ribavirin is quite good (80-97%) in Pakistan (Akhtar et al., 2015; Ahmad et al., 2012; Ahmad et al., 2013). In Pakistan major prevalent HCV genotype (3a), which is generally considered a good responder of interferon therapy, host and viral factors cumulatively favors therapy response (Afzal et al., 2011, 2013, 2014;

Anjum et al., 2013 a, b). The higher SVR of interferon therapy and high cost of DAA raise the question of DAA future in developing countries like Pakistan. This high cost of DAA will be the major obstacle in HCV eradication from the globe because the developing world accounts for 80% of the global HCV burden. Interferon based therapy will remain the first choice of major proportion of HCV patients because of high cost of DAA and no insurance/reimbursement programme in developing countries.

**References**

- Afzal MS, Ahmed T, Zaidi NU. (2014). Comparison of HCV prevalence in Pakistan and Iran; an insight into future. *Hepat Mon*, **14**, 11466
- Afzal MS, Anjum S, Zaidi NU. (2013) Effect of functional interleukin- 10 polymorphism on pegylated interferon- $\alpha$  plus ribavirin therapy response in chronic hepatitis C virus patients infected with 3a genotype in Pakistani Population. *Hepat Mon*, **13**, 10274
- Afzal MS, Anjum S, Zaidi NU. (2014). Changing of HCV clade pattern in Iran; the possible means for something good. *Hepat Mon*, **14**, 11879
- Afzal MS, Khan MY, Ammar M et al (2014). Diagnostically untypable hepatitis C virus variants: it is time to resolve the problem. *World J Gastroenterol*, **20**, 17690-2
- Afzal MS, Tahir S, Salman A, et al (2011). Analysis of interleukin-10 gene polymorphisms and hepatitis C susceptibility in Pakistan. *J Infect Dev Ctries*, **5**, 473-9
- Ahmad B, Ali S, Ali I et al (2013). Conventional Interferon Therapy Response among Chronic HCV Patients in Khyber Pakhtunkhwa. *J Infect Dis Ther*, **1**, 104.
- Ahmad B, Ali S, Ali I, Azam S, Bashir S (2012). Response rates of standard interferon therapy in chronic HCV patients of Khyber Pakhtunkhwa (KPK). *Virol J*, **9**, 18.
- Akhtar N, Bilal M, Rizwan M. et al (2015). Genotypes of hepatitis C virus in relapsed and non-respondent patients and their response to anti-viral therapy in district mardan, khyber pakhtunkhawa, Pakistan. *Asian Pac J Cancer Prev*, **16**, 1037-40.
- Amer S, Hajira A, Muqetadnan M. (2014). The hepatitis c virus treatment revolution-can the developing world afford it? *J GHR*, **3**, 1131-2.
- Anjum S, Afzal MS, Ahmad T, et al (2013). Mutations in the STAT1-interacting domain of the hepatitis C virus core protein modulate the response to antiviral therapy. *Mol Med Rep*, **8**, 487-92
- Anjum S, Wahid A, Afzal MS, et al (2013). Additional glycosylation within a specific hypervariable region of subtype 3a of hepatitis C virus protects against virus

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neutralization. *J Infect Dis*, **208**, 1888-97.

Gane ED. (2014). Hepatitis C beware-the end is nigh. *Lancet*, **384**, 1557-60.

World health Organization. <http://www.who.int/countries/pak/en/> data collected on 07 March 2015.

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