Can haemoglobin drop replace rapid virological response in predicting SVR?

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Introduction

Hepatitis C treatment with peginterferon and ribavirin may lead to bone marrow suppression, haemolysis and anaemia[1]. Previous retrospective cohorts have reported a reduction in haemoglobin ≥3g/dL in over 50% of all patient receiving combination therapy[2]. A drop in haemoglobin (3 >g/dL) during the first 8 weeks of treatment has been associated with a higher sustained virological response (SVR- 6 months post-treatment) rates in previous studies [1]

In this study we measure the change in haemoglobin with peginterferon and ribavirin treatment and establish whether this predicts SVR.

Method

This was a retrospective cohort of all HIV infected individuals commencing interferon for hepatitis C therapy between January 2007 and September 2010. The clinic prescribing database identified 69 patients started on peginterferon and ribavirin treatment. Patients were separated into two groups according to their SVR at 6 months post therapy. The change in haemoglobin from baseline (+/-2weeks) to week 4 (+/-2weeks) was measured for patients in both groups. A Mann-Whitney U-test, a Yate's corrected chi-squared test and unpaired t- tests were used to test for associations between the rapid virological responders and non-responders, subsequent SVR and the mean change in haemoglobin at week 4.

Results

Table 1:Patient characteristics

Total number of patients	69
Age (range)	31-71
Sex :	
Male	63 (91%)
Female	6 (9%)
Acute hepatitis	38 (55%)
HCV genotype 1	50 (72%)

- 28 patients (40%) had a RVR and 37 (54%) did not have a RVR, 4 (6%) patients had missing data. Of those that achieved a RVR; 21 (75%) had a SVR and 7 (25%) did not have a SVR (p=0.044). The average haemoglobin (hb) drop (n=69) was -1.3g/dL, and the mean drop in haemoglobin in the " no SVR group" (n=25) was -1.2 g/dL and -1.3g/dL in the "SVR group" (n=44). The mean drop in haemoglobin did not differ significantly between the 2 groups (p =0.401).
- In the "no RVR group" the mean hb drop was -1.0 (-2.4 to -0.5), n=37 and the mean hb drop was -1.4 (-2.1 to -0.2), n=28 in the "RVR group". There was no significant difference between mean Hb drop in the "RVR" and "no RVR" group (p=0.942)

Table 2 : Relationship between Hb drop, RVR and SVR

	RVR is for rapid virological response SVR is for sustained virological response			
	Total (n=69)	**SVR (n=44)**	**No SVR (n=25)**	**p-value**
#Gender				
F	6	3 (6.8)	3 (12.0)	0.463
M	63	41(93.2)	22(88.9)	
&Hb Change (Baseline-week 4)	-1.3 (-2.3 to -0.3) Range:-2.3 to 4.0	N=43 -1.3(-2.5 to -0.3) Range -4.8 to 4.0	-1.2(-1.9 to -0.6) Range -4.2 to 0.8	0.401
^ RVR				
Missing	4	4 (9.1)	0(0.0)	0.044
No	37	19 (43.2)	18 (72.0)	
Yes	28	21(47.7)	7(28.0)	

#Mean (SD), p-value unpaired t-test
&Median (IQR) , p-value Mann-Whitney u test
^n(%), p-value using Yate's corrected chi-squared test

Conclusions

•A rapid virological response at 4 weeks and a haemoglobin drop > 3g/dL have both been shown to predict SVR rates. In this study we establish whether a drop in Haemoglobin could predict SVR rates and therefore negate the need for a HCV RNA polymerase chain reaction at 4 weeks which may be useful due to cost and unavailability in some clinical settings.
•RVR did show a significant association with SVR (p=0.044) but the drop in haemoglobin was not significantly associated with SVR (p=0.401) or RVR (p=0.942).
• This maybe due to the presence in this HCV-HIV cohort of the protective inosine triphosphatase (ITPA) allele which reduces ribavirin -induced anaemia [3]. Possibly by decreasing ITPA activity which in turn enables the synthesis of ATP by substitution of guanosine triphosphate (GTP) with inosine triphosphate (ITP). ATP is required to protect against ribavirin-induced oxidative damage to the membrane of red blood cells[4].

References

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