SERUM ALPHA-FETOPROTEIN (AFP), ALPHA-FETOPROTEIN LENS CULINARIS AGGLUTININ 3 (AFP-L3) AND DES-GAMMA CARBOXYPROTHROMBIN (DCP) RESPONSES FOR MONITORING TREATMENT OUTCOMES IN PATIENTS WITH HEPATOCELLULAR CARCINOMA TREATED BY TRANSARTERIAL CHEMOEMBOLIZATION

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Background: Conventional use of Alpha-fetoprotein (AFP) measurement alone without doing contrast enhanced computed tomography (CECT) couldn't be applied as further treatment decision after transarterial chemoembolization (TACE) therapy in patients with hepatocellular carcinoma (HCC).

Objective: To find out the association between tumor marker responder using AFP and US FDA approved serum biomarkers specific for HCC like Alpha-fetoprotein Lens culinaris agglutinin 3 (AFP-L3), Des-gamma carboxyprothrombin (DCP) and radiological responder using modified Response Evaluation Criteria in Solid Tumors (mRECIST) criteria at before and one month after TACE in patients with HCC.

Methods: Hospital based cross sectional analytical study was done in 85 HCC patients who had indications to undergo TACE. The study period was two years study starting from October 2018. Exclusion criteria were who had normal AFP (< 10 ng/dl), who had other treatment for HCC and who had radiological features of which could not be assessed by mRECIST criteria.

Serum AFP was measured by e 411 fully automated immunoassay analyzer. Serum AFP-L3 and DCP were measured by sandwich-ELISZ kit with semi-automatic immunology analyzer assay.

AFP, AFP-L3 % and DCP responder was defined as a reduction of tumor marker level *more than 50%* from baseline at one month after TACE.

Radiological responder using mRECIST criteria was classified as *complete response (100%)* and *partial response* (more than 30% decrease in the sum of longest diameters of viable arterially enhancing target lesions compare with baseline measurement) at one month after TACE.

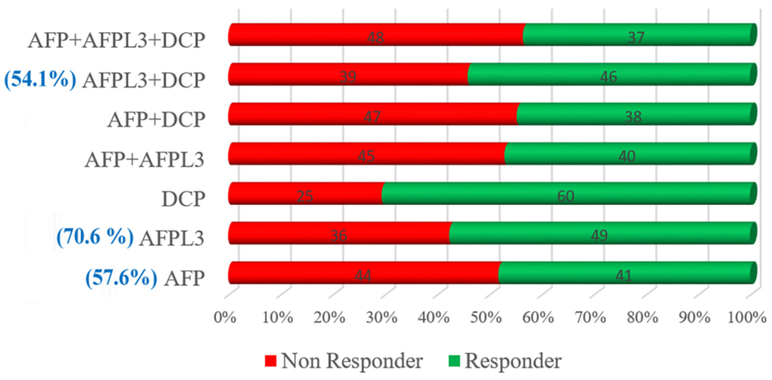
Conclusion: Among patients with *DCP tumor marker non-responder* who should not be necessary for follow-up imaging with CECT (4 phases liver) for further TACE procedure while *DCP tumor marker responder* who should be done for follow-up CECT (4 phases liver). *If complete response* was occurred on CECT scan, *there is no need to do further TACE procedure* whereas *partial response* was resulted, *further TACE procedure is needed.*

Recommendation

Des-gamma carboxyprothrombin (DCP) tumor marker measurement is more informative than conventional use of AFP for further treatment decision after TACE in patient with HCC.

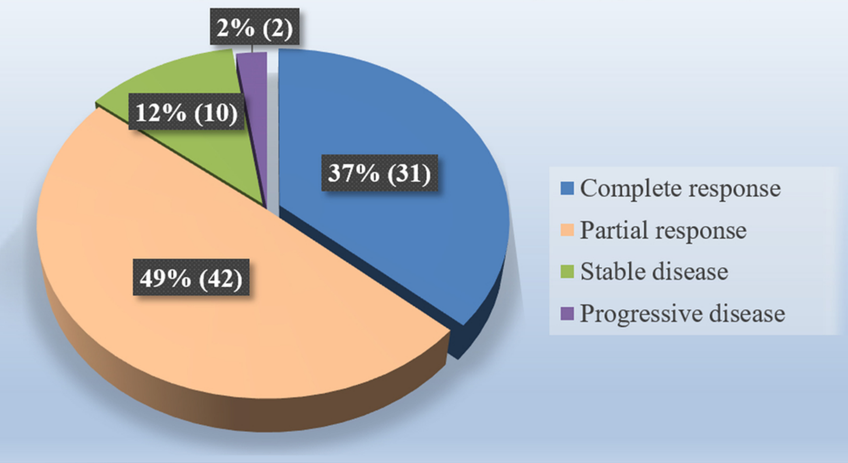
RESULT

Figure (1) Distribution of serological tumor marker responses after TACE among study population (n=85)



According to the highest to lowest responder
- ***DCP*** responder was (70.6%)
- ***AFP-L3%*** responder was (57.6%)
- ***DCP + AFP-L3%*** responder was (54.1%)
- Other tumor marker responses were less than 50%

Figure (2) Distribution of radiological tumor responses after TACE according to mRECIST Criteria among study population (n=85)



According to radiological responses using mRECIST Criteria
- ***Radiological responder*** was (86%)
- ***Radiological non responder*** was (24%)

Radiological responder = complete or partial response
Radiological non-responder = stable or progressive disease
Progressive disease - at least 20% increase in the sum of longest diameters of viable target lesions.
Stable disease - do not qualify as either partial response or progressive disease

Table (1): Association between *tumor marker response* and *radiological response* using mRECIST criteria (n=85)

Tumor marker response	mRECIST response				χ^2	P value
	Complete response	Partial response	Stable disease	Progressive disease		
AFP (R)	19 (46.3 %)	20 (48.8 %)	2 (4.9 %)	0 (0.0 %)	7.179	0.066
AFP (NR)	12 (27.3 %)	22 (50.0 %)	8 (18.2 %)	2 (4.5 %)		
Total	31 (36.5 %)	42 (49.4 %)	10 (11.8 %)	2 (2.4 %)		
AFP-L3 (%) (R)	22 (44.9 %)	25 (51.0 %)	2 (4.1 %)	0 (0.0 %)	10.841	0.013
AFP-L3 (%) (NR)	9 (25.0 %)	17 (47.2 %)	8 (22.2 %)	2 (5.6 %)		
Total	31 (36.5 %)	42 (49.4 %)	10 (11.8 %)	2 (2.4 %)		
DCP (R)	31 (51.7 %)	29 (48.3 %)	0 (0.0 %)	0 (0.0 %)	41.765	< 0.001
DCP (NR)	0 (0.0 %)	13 (52.0 %)	10 (40.0 %)	2 (8.0 %)		
Total	31 (36.5 %)	42 (49.4 %)	10 (11.8 %)	2 (2.4 %)		
AFP + AFP-L3 % (R)	19 (47.5 %)	19 (47.5 %)	2 (5.0 %)	0 (0.0 %)	7.293	0.063
AFP + AFP-L3 % (NR)	12 (26.7 %)	23 (51.1 %)	8 (17.8 %)	2 (4.4 %)		
Total	31 (36.5 %)	42 (49.4 %)	10 (11.8 %)	2 (2.4 %)		
AFP + DCP (R)	19 (50.0 %)	19 (50.0 %)	0 (0.0 %)	0 (0.0 %)	13.156	0.004
AFP + DCP (NR)	12 (25.5 %)	23 (48.9 %)	10 (21.3 %)	2 (4.3 %)		
Total	31 (36.5 %)	42 (49.4 %)	10 (11.8 %)	2 (2.4 %)		
AFP-L3 % + DCP (R)	22 (47.8 %)	24 (52.2 %)	0 (0.0 %)	0 (0.0 %)	17.853	< 0.001
AFP-L3 % + DCP (NR)	9 (23.1 %)	18 (46.2 %)	10 (25.6 %)	2 (5.1 %)		
Total	31 (36.5 %)	42 (49.4 %)	10 (11.8 %)	2 (2.4 %)		
AFP + AFP-L3 % + DCP (R)	19 (51.4 %)	18 (48.6 %)	0 (0.0 %)	0 (0.0 %)	13.236	0.004
AFP + AFP-L3 % + DCP (NR)	12 (25.0 %)	24 (50.0 %)	10 (20.8 %)	2 (4.2 %)		
Total	31 (36.5 %)	42 (49.4 %)	10 (11.8 %)	2 (2.4 %)		

DCP or AFP-L3% tumor marker responder was significantly associated with radiological responder (p=0.013 and p<0.001) while AFP responder was not associated. Combination of DCP plus AFP/AFP-L3% was also positively associated with radiological responder (p=0,004 and p<0.001). The combination of all three tumor marker responder (DCP plus AFP plus AFP-L3%) was also associated with radiological responder (p=0.004).