**Aim:** To analyze the differences of the expression of DACH1 in different groups of liver diseases (liver cirrhosis, fatty liver and chronic hepatitis), study the relationship between clinical pathological features (stage, pathologic grade and type, age and gender) of liver cancer and the expression of DACH1 and SIX1 which are the main members of The Retinal Determination Gene Network (RDGN) and explore the correlation among DACH1, SIX1 and cyclinD1 in the tissues of liver cancers.

**Methods:** The expression of DACH1 in one tissue microarray including 120 cases of different hepatic diseases and the expression of DACH1, SIX1 and cyclinD1 in another tissue microarray including 120 cases of liver cancers and normal liver were detected by immunohistochemical methods. One-way ANOVA, Chi-square test, orderly logistic regression were used for data analysis.

**Results:** In the liver cirrhosis, fatty liver and chronic hepatitis groups, DACH1 expression was lower than in the normal liver group. The amount of DACH1 in liver cancer tissues was lower than the three liver benign disease groups and normal group (P < 0.001), the expression of SIX1 was higher than normal group (P < 0.001), while there was no significant difference in the expression of cyclinD1 between the normal group and liver cancer group. Poorly differentiated liver cancer tissues was linked with the lowest expression of DACH1 (P < 0.001, OR1/3 = 0.548); and there was a positive correlation between the expression of SIX1 and disease stage and pathologic grade (P < 0.05, OR1/III = 1.131, OR1/3 = 1.225). In addition, in the same liver cancer tissues, the correlation of DACH1, SIX1 and cyclinD1 cannot be found.

**Conclusions:** Several hepatic diseases were related to the low expression of DACH1 which has a negative correlation with pathologic grade and shows it may participate in regulating the occurrence and development of these diseases, especially in liver cancer tissues, and may play a protective role in these liver diseases. The high expression of SIX1 is associated with the low differentiation and advanced stage of the liver cancer, therefore, it may participate in relevant mechanisms of the progression of liver cancers.

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