ASSOCIATION OF PLASMA (U2) SMALL NUCLEAR RNA FRAGMENTS AND COLORECTAL CANCER IN A COHORT OF EGYPTIAN PATIENTS

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Introduction

Colorectal cancer (CRC) is the third most common malignancy worldwide
In Egypt, CRC is the 7th commonest cancer.
The CRC is the second deadliest cancer worldwide.
Screening for early cancer stages is an effective way to reduce cancer mortality.
Development of new biomarkers for noninvasive screening procedures is aid to early diagnosis of cancers and to help in reducing mortality and morbidity.
Non-coding RNA is a functional RNA that does not encode a protein.
Non-coding RNAs are classified into small non-coding RNAs such as small nuclear RNA (snRNA) and long non-coding RNAs .
SnRNAs are known as U small nuclear RNA.
U2 snRNA fragments proved to be highly stable in the serum, plasma and other body fluids from cancer patients and could be detected by a simple routine PCR-based assay.
Detection of U2 snRNA fragments in the blood can also hold promise for detecting some cancer types at a curable stage.

Aim of the work

The aim of this study was to investigate the association between plasma (U2) small nuclear RNA fragments, and colorectal cancer in a cohort of Egyptian patients.

Patients and Methods

The current study was carried out on 50 individuals: **Twenty-five** newly diagnosed primary colorectal cancer patients recruited from the Surgery Department of Alexandria Main University Hospital. **Twenty-five healthy individuals** with matched age and sex were included as a control group.

All the patients included in the study were subjected to the following: Thorough history taking: age, sex, positive family history. through physical examination with details of colorectal examination. Radiological examination: CT and chest x rays Coloscopy and biopsy followed by histopathological examination. Histopathological examination of the tumors after surgery for assessment of grade, stage, and lymph vascular infiltration. Routine laboratory investigations: 1.CBC 2.Liver function test 3.Renal function test. 4.tumor markers: CEA - CA19-9. Molecular analysis: Relative expression of U2 small nuclear RNA fragment in plasma samples from both colorectal cancer patients and controls using reverse transcription Real-Time PCR.

Results

U2snRNA was statically significantly higher in cancer patients compared with the control group ($p<0.001$).

Table 1: Comparison of U2snRNA between the two studied groups

U2snRNA	CRC Cases(n = 25)	Control (n = 25)	U	P
Min. – Max.	1.21 – 31.49	0.46 – 2.47	14.0*	<0.001*
Median (IQR)	7.50 (3.6 – 10.6)	0.87 (0.71 – 1.3)		

IQR: **Inter quartile range**
SD: **Standard deviation**
U: Mann Whitney test
p: p value for comparing between the studied groups
*: Statistically significant at $p \leq 0.05$
CRC: Colorectal cancer

CEA was significantly higher in cancer patients compared with the control group ($p=0.002$).
There were no statistically significant differences between both groups as regards CA19-9 ($p=0.337$).

Table 2: Comparison between the two studied groups according to tumor markers

Tumor markers	CRC Cases (n = 25)	Control (n = 25)	U	P
CEA (ng/mL)				
Min. – Max.	4.13 – 17.10	0.70 – 5.0	155.0*	0.002*
Median (IQR)	5.23 (4.43 – 7.11)	4.70 (4.50 – 4.90)		
CA19-9 (ng/mL)				
Min. – Max.	10.10 – 212.0	7.0 – 39.00	263.0	0.337
Median (IQR)	21.40(16.60 – 28.20)	32.0 (8.0 – 35.0)		

IQR: **Inter quartile range** SD: **Standard deviation** **U: Mann Whitney test**
p: p value for comparing between the studied groups
*: Statistically significant at $p \leq 0.05$
CRC: Colorectal cancer

Conclusion

From this study we can conclude the following:
Serum U2 snRNA could be used as a potential biomarker for CRC with high sensitivity and specificity.
Importance of CEA monitoring in CRC patients rather than CA19.9.