Monoamine Oxidase Enzyme Activity and Estimation of the Most Appropriate Conditions for Enzyme Activity in Iraqi Women with Breast Tumor .

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الخلاصة

كرست هذه الدراسة لقياس الفعالية الأنزيمية لأنزيم أحادي أمين اوكسيديز وتقدير الظروف المثلى اللازم توفرها لعمل هذا الإنزيم بكامل فعاليته في النماذج المأخوذة من دم النساء العراقيات البالغ عددهن 40من المصابات بأورام الثدي وقد وجد ان الإنزيم يكون بفعالية إنزيمية عالية في حالة نماذج الأورام الخبيثة وكذلك عند توفر الظروف الأكثر ملائمة لعمل الإنزيم بكامل فعاليته متمثلة بتركيز المادة الاساس عند التركيز (0.008 مولاري) وبفترة زمنية تبلغ ثلاث ساعات عند درجة حرارة 37 مئوية ودرجة الأس الهيدروجيني 7.4 في حالة المرضى بالأورام الحميدة والمجموعة المسيطرة أما في كون النماذج المشخصة كأورام خبيثة فان الأس الهيدروجيني يكون 7.2.علما انه تم تصنيف النماذج الى حميد او خبيث حسب نتيجة التحليل المختبري لعينة النسيج المأخوذة من منطقة ورم كل مريض .

Abstract:

This study is devoted to the measurement of clinicohistopathological features in tissue samples of (40) women for each of malignant and benign breast tumor in addition to (40) healthy women of matched age as a control group .and estimation of monoamine oxidase activity and the most appropriate conditions for the enzyme activity in Iraqi women with breast tumor .It was noted that the enzyme in case of malignant tumor was highly active and when the most conditions where available at substrate concentration was (0.008 M) with incubation time (3 hours) at (37 Cº)and pH(7.2) for malignant group and (7.4) for benign and control group.

Key words: *monoamine oxidase –A, breast tumor ,enzyme activity*

1. Introduction:

1.1 Monoamine Oxidase

The enzyme monoamine oxidase MAO [Enzyme Commission EC 1.4.3.4] is discovered as tyramine oxidase by Marry C. Hare (1928), it activated the oxidative deamination of tyramine. L-Monoamine oxidases (MAO) is afamily of enzymes that catalyze the oxidation of mono- aminesHttp://en.wikipedia.org/wiki/Monoamine_oxidase - cite_note-pmid15279561-1. They have found linked to the outer membrane of mitochondria in almost all cell types in the body.In humans there are two functionally distinct forms of the MAO enzyme: MAO-A and MAO-B[1-4].

1.2 Role and Function of MAOs Isoenzymes

Both MAOs isoenzymes catalyze the oxidation of various amines, together with serotonin, dopamine and epinephrine . However, whereas MAO-B has a greater affinity for the trace amine, phenethylamine, MAO-A is more selective and likely to degrade serotonin, epinephrine and nor epinephrine[5-10] .

1.3 Breast Cancer

Female breast is made up mainly of lobes (milk-producing glands), ducts (tiny tubes that carry the milk from the lobes to the nipple) and stroma (fatty and connective tissues surrounding the ducts and lobes, blood and lymphatic vessels)[11-15].

Breast cancer is the most common cancer in women in developed countries . As breast cancer is a heterogeneous disease. Breast cancer tumors are highly heterogeneous in their morphology, biology, response to therapy and clinical course [16-20].

Breast cancer is a kind of cancer that develops from breast cells. Breast cancer usually starts off in the inner lining of milk ducts or the lobules that supply them with milk. A malignant tumor can spread to other parts of the body. A breast cancer that started off in the lobules is known as lobular carcinoma, while one that developed from the ducts is called ductal carcinoma [21-23].

2.Methodology:

A- Monoamine oxidase activity.

Principle:

Mono amino oxidase activity was assayed by Mcewen and Cohen method (M.Charles, 1963). The principle of the method is the measurement of the benzaldehyde which obtained reaction which is absorbed at wave length

242 nm after extraction by cyclohexane.

Reagents

1-phosphate buffer solution (PBS) (0.2 M) (pH7.4).

2-Benzyl amine (0.008 M).

3-Perchloric acid.

4-Cyclohexane.

Procedure

The assay procedure is described in the Table (2-3).

Table (2-3).The procedure of MAO enzyme activity.

Solution	**Test**	**Control**
Sample(blood)	**600 µL**	**600 µL**
PBS	**750 µL**	**750 µL**
Benzyl amine	**150 µL**	**--------**

All test tubes are incubated in shaking water bath for 3hrs. at37 ºC. Then the following are added

Benzyl amine	-------	150µL
Perchloric acid	150 µL	150µL
Cyclohexane	1.5µL	1.5µL

And shaking for (15 Min.), then centrifugation (2000 r.p.m.) for 10 min. Then the absorbance of supernatant is measured at 242 nm. Enzyme activity measured through aldehyde formed in 3 hrs. by reading the absorbance of test tube against the control tube by the spectrophotometer.

B- Estimation of the Most Appropriate Conditions for Enzyme Activity.

Principle:

The procedure is followed as the same steps that is described in enzyme activity by adding different concentrations of substrate (0.006, 0.008, 0.02, 0.04, 0.06) M (M:molar concentration) . and same for other optimum conditions.

3. Results:

Results of the present study showed that:

1-The mean age at diagnoses was (44) years for malignant patients' and (36) years for benign group the percentage of patients 'according to the age range was (50%) with (40-49) years for malignant & (60%) with age range (30-39) years for benign group.

2-there was a high activity of MAO-A for malignant patients samples .

3-Regarding to benign samples there was clear decrease in enzyme activity.

4-The optimum substrate enzyme concentrations evaluated with different concentrations of benzyl amine as a substrate the increase in the enzymatic activity is directly proportional to substrate concentrations in the concentrations (0.008 M).

5-The activity of MAO-A increases by increasing the incubation time for all studied groups.

6-The optimum temperatures that observed were ($37^{o}C$).

7-the optimum pH for malignant group was 7.2 and for benign & control group was (7.4).

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