Narrative Syntax in Kurdish Folktales

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Abstract

Narrative analysis has become a fruitful area in different fields of knowledge. Narrative can be studied in literature, linguistics, stylistics, sociolinguistics, psychology, medicine, etc. The present paper aims at studying the narrative structure of three Kurdish folktales in a syntactic perspective, since the area of structural patterns that make up the Kurdish folktales has not got much attention of academic research.

To achieve this purpose, the three Kurdish folktales, 'The Result of Greed', 'The King and Fate', and 'Strike, Strike, What You Saw is All What You Get', are analyzed according to Labov's narrative syntax. It is hypothesized that Labov's syntax is applicable to the analysis of the Kurdish folktales narrative structure. The study has concluded that Labov's model can be regarded as syntax for the Kurdish folktales as it is for natural (i.e., orally told) narratives.

Key words: Narrative, Narratology , Narrative Syntax, Kurdish Folktales

1. Introduction: Concepts

Narrative texts permeate our lives, and human beings are said to be always tale tellers. If we look at newspaper reports, history books, novels, short stories, or listen to someone telling us their experience about a specific accident they had, then we will have a complete image of what the term narrative means.

According to Trask (2007), narrativeis"a text which tells a story…it relates a connected series of events…either real or fictional, in a more or less orderly manner" (2007:181). Crystal's (2008: 320) definition to narrative states that "a narrative isa recapitulation of past experience in which language is used to structure a sequence of (real or fictious) events, [while] the study of narratives is called Narratology ."

Depending on these two definitions, one can say that novels, short stories, tall tales, folktales, etc. are all different forms of narrative. Our main concern in the present study is the folktales.

A folktale is a narrative "which has been handed down from generation to generation either in writing form or by word of mouth (Thompson 1977: 4).The Kurds have an amusing oral history and culture, part of which is represented in Kurdish folktales. This oral cultural knowledge is passed from a generation to another and it has an influence on the people's social life. Recently, these kinds of oral arts have been recorded, written and published in Kurdistan. Some of them have been translated into world languages, especially into English. The three selected folktales are taken from a special issue of the International Journal of Kurdish Studies, which features Kurdish folktales from the Sulaimani and Kirkuk regions of Iraqi Kurdistan (Tofiq, 2005).

2. A Narrative Syntax

In his 'The Transformation of Experience in Narrative Syntax' the American linguist, William Labov (1972:354-96), analyzed a large body of recorded oral narratives. According to Labov,a minimal

narrative is made up of a "sequence of two clauses which are temporally ordered", that is, it comprises two clauses which have a single temporal juncture (Labov 1972: 360-61), so any change in the order will result in a change in their semantic interpretation, as in:

1. (a)This boy punched me(b) and I punched him.
2. (a) I punched him(b) and he punched me.

The order of the clauses shows that in (1a) the boy first hit the speaker, and in(1b) the speaker took his revenge on the boy, while the reverse happened in(2a and b) respectively.

Labov (1972:362)distinguishes between two types of clauses within the skeleton of the narrative: narrative clause and free clause. Narrative clause is a " temporally ordered clause". A free clause is a clause which is not "confined in a temporal juncture."It is free in a sense that is moveable; it can be moved anywhere in the story . The overall structure of complete oral versions of narrative in Labov's syntax includes six elements each of which tries to answer a hypothetical question:

1. Abstract :What was this about?
2. Orientation :Who, When ,What, Where?
3. Complicating action :Then what happened?
4. Evaluation: so what?
5. Result or Resolution: What finally happened?
6. Coda: It prevents any further questions regarding the story events.

Abstract

Usually narrators begin their stories with" one or two clauses summarizing the story "(Labov1973:363). The abstract signals that the story is about to begin and draws the attention of the listener .Syntactically ,the abstract is realized in terms of short summarizing clauses provided before the narrative commences. Usually English folktales start with phrases such as 'once upon a time' as an abstract, which has an equivalent in Kurdish 'habu nabu'jarekia'or 'jarak la jara'.

Orientation

Orientation usually consists of some free clauses that orient the listener in respect of person, time, place, and behavioral situations . Orientation in the narrative is marked by past progressive verbs and adjuncts of time ,place ,and manner(Labov1972: 364) about person ,manner ,and time—they make up the orientation section. The placement of orientation clauses is usually before the narrative clauses (Labov 1972: 364-5).

Complicating Action

Complicating action is the most important element in the narrative in which the narrative clauses are contained. A narrative clause usually conveys a series of events .Complicating action begins from the first narrative clause and ends up with a result . Formally ,complicating action can be recognized by temporally ordered narrative clauses with verbs in the simple past or present (preterit verbs ,in Labov's (1972: 376) terminology).It is worth stating that this element is the core of narrative without which it is impossible to have anarrative (Labov 1972: 360).

Evaluation

Labov defines evaluation as" thatpartof narrative which reveals the attitude of the narrator" towards the events .It functions to make the point of the story clear .It is by this element that the narrator wards off the "so what?" question which the listener may ask (Labov 1972:370). The evaluation is the most sophisticated and problematic section in Labovian story grammar. It is of

two types: external and internal evaluation (Labov 1972: 371-72).External evaluation can be identified, simply, when the narrator stops the flow of narrating and turns to the listener to tell her/him what the point of the narrative is ,that is, why s/he is telling the story (Labov1972:370-71).It can also be expressed by indicating the reaction of the narrator to the events being reported ,i.e.,by quoting her/his sentiment when the action went off (Labov 1972: 371-72).

The internal (or embedded)evaluation is more complicated than the external one .As the word 'embedded' implies ,the evaluative materials (or devices) here are woven into the narrative clauses(Labov 1972: 372). In the analyses of the folktales more will be exposed about this portion of the narrative syntax.

Resolution

Resolution is defined as the "portion of the narrative which follows the evaluation. If the evaluation is the last element then the resolution section coincides with it.It signals the end of the story proper. Resolution is the result of all of the narrative clauses (Labov 1972: 370).

Coda

Usually narratives end up with the resolution section ,but for a complete narrative one or two free clause(s) are required forming what Labov (1972:365) calls coda. The coda bridges the gap between the moment of the time at the end of the narrative proper and the present. It also closes off the sequence of narrative clauses and indicates that none of the events that follow are important (Labov1972:365-66).

To sum up ,a complete narrative is summarized in the abstract ,begins with an orientation ,proceeds to the complicating action ,is suspended at the focus of the evaluation before the resolution, concludes with the resolution , and returns the listener to the present time in the coda.

The Kurdish folktales in the present study will be analyzed to see whether or not they provide the answers for these six questions ,as Labov claims that the oral narratives do.

3. The Analyses of the folktales

1. 'The Result of Greed'

Abstract

In this tale, the opening paragraph can be considered as an indicator of the abstract section .The narrator prepares his/her reader or listener to him/her with the help of the first paragraph that the narrator is going to recapitulate a story. Most of the Kurdish folktales begin with a very unique fixed expression, (Habu nabu kas laKhuday gawratir nabu), dagernawa rozhak…(Once upon a time,No one was Greater than Allah, they say that once….) In the Kurdish community whenever this expression is heard, all the people realize that the utterer is claiming the floor[1]. The story preface may differ from variety to variety, storyteller to storyteller. So in the token, this tale starts with

They say that a long time ago there was a poor shepherd.

If we look at the verb tense of this first clause 'They say…' which is present simple, and the *that claus e*'that a long time ago there was a shepherd,' which is past simple we feel that we are

[1] For further examples of this opening expression see:

1. *Kurdish Folktale* by Tofiq (2005)
2. *Haqayat u Afsanay Millatan (The Folktales and Legends of the Nations)* by Abdulla*(2011).*
3. *Afsanakan wa degênawa* (As the Legends Narrate) by Mawlud (2012).

This issue can be dealt with as a sociolinguistic fact, as well.

going to have a journey to a past event. The narrator links the past events to the present time. Above all, the title, 'The Result of Greed', is also another indication of the fact that the narrator is about to tell us a story about the outcome of greediness. One can say that the title and the first paragraph can be considered as a summary for the whole tale. In Labov's narrative syntax, this is the form and function of an abstract.

Orientation

As we mentioned earlier, orientation tells us who, what and which are involved in the story, and where, when and how the story events took place. In the last part of the first sentence we are told that this story tells about a poor shepherd (*who*). Then comes the second sentence,

> Every day he took his flock of sheep to a meadow far from the village, and there he pastured them.

Every day is a noun phrase that indicates the frequency (and syntactically it functions as an adverb of time), while *his flock of sheep* is another noun phrase that indicates the thing (*what* in Labov's label). *To a meadow far from the village*sets the place where the story happened. These orientation elements are seen at the very onset of the tale and later in the story. There are other person, place, time, and manner indicators as well. Some of them are:

- One day around midday (time)
- near a pile of rocks, next to the rocks(place)
- bread, milk, pot, snake, coin,(things)
- his son(person, the shepherd's son)

All of the above analyses prove that that Labov's elements for orientation exist in the present tale.

Complicating Action

If we consider Labov's definition for complicating action as the first two clauses which are temporally integrated we have to say that this portion of the present folktale begins with the first three clauses of the second paragraph:

a. One day around midday, near a pile of rocks, he took a sheep, [1]
b. milked it into a pot,
c. and let it go.

Syntactically, there is a temporal juncture between the clauses a-c in that we can say that *first* he (the shepherd) took a sheep, *second* milked it into a pot, and *third* let it go. Another point is that the clauses are in past simple form which is also a very common feature of this narrative element.

One more thing about these three narrative clauses is that they are the basis for the rest of the narrative clauses in the current folktale. Let us see some more examples:

d. Putting the pot next to the rocks, he went
e. and sat down to eat some bread and drink some milk.
f. From after his eye spied a snake coming out from the pile of rocks.
g. It swallowed the milk in the pot
h. and then went back into the rocks,
i. took a coin in its mouth,
j. brought it,
k. and put it into the pot.
l. The shepherd came
m. and put the coin in his purse,
n. and he was so happy
o. his feet didn't touch the ground. (Tofiq 2005: 50)

In the above clauses *d-n*, one can notice that the clauses are all simple, with preterit verbs, in their structures. There is an exception in the beginning part of *a* and the end of *n*which can be

[1] Like Labov (1972), we also use alphabetic format for numbering the narrative clauses.

regarded as evaluative devices, as we will elaborate it in the evaluation section of the current tale below.

Evaluation

The narrator of the present folktale employs various devices to evaluate its points. The story teller uses both internal and external evaluation from the very beginning up to the end of the story.

The title 'The Result of Greed 'can be regarded a comment on the whole story. The narrator wants to say that it is because of greediness of the shepherd, first, and then his son, that they both are bitten by the snake. This type of evaluation is called external. From here and there the narrator hangs the events of the tale to reinforce the title. Some examples are:

- he was so happy his feet didn't touch the ground.
- but that night he didn't sleep a wink.
- The son started thinking to himself, "By God, I have a silly father. Why should I sit around waiting for one coin a day? Why don't I just kill the snake and get the whole treasure for myself?"(50)
- Recently your son attacked me and cut my tail off. When my spell wears off, I will be marred. Now, as a punishment for not keeping this secret in your heart, I will have to kill you too." And she bit the man on top of his head and killed him dead on the spot. (51)

Looking at the above extracts again, we can identify some external and internal evaluation. The shepherd's being so happy that his feet didn't reach the ground is an external evaluation.

The use of non-assertive expressions, *didn't touch*,*didn't sleep*, *why should*, *why don't*, *not keeping*, is a syntactic device by which the narrator comments on the events of the tale. Labov (1972:381-86) thinks that the use of negatives, questions, models, future, direct speeches, and imperatives is to a tool by which the narrator evaluates the tale. According to Labov the rituals like *"By God…,"* the shepherd's going to pilgrimage, and cutting the snake's tail[1], are internal evaluations.

Another internal evaluation device is the use of foreshadowing and flashback. In the current tale the title is a foreshadowing because it foresees that the man's greed will lead to the loss of his son and himself as well. Flashback is also used when the man returns from haj and says "*One way or another, this son of mine must have done something to make the snake kill him*." Again in another direct quote by the snake that goes "*Recently your son attacked me and cut my tail off.*" This can also be called an embedded narrative, whose intention is also to give evaluation to the event(s). The snake continues by saying "*now, as a punishment for not keeping this secret in your heart, I will have to kill you too.*" The use of negative and future is again an evaluation marker. One last remark about evaluation section in this folktale is that one can find that its elements are scattered all over the whole tale, in all the parts of the narrative.

Resolution

As we said earlier, in Labov's narrative syntax, a resolution provides an answer to the reader or listener's question, "*What finally happened?*" Thus this can be the last narrative clause in the story. Actually, the narrative clauses of the present story can be divided into two sets of narrative clauses; the first set tells the story of the son; and the other set tells the father's. On this basis we can say we have two resolutions as far as narrative clauses are concerned but in the end both resolutions are the same. The following are the two resolutions indicators for the current story:

1. <u>What finally happened to the son?</u>
   p. The snake hissed
   q. and attacked the boy,
   r. bit him on the top of his head,

[1] Culturally in some Kurdish rural communities, there is a belief that says "a snake never forgets its tail." Thus, we can predict that the snake will take revenge on the shepherd's son first and on his father as well. Therefore we can say that culturally it is a foreshadowing for what happens to the son and the father at the end of the story.

s. and killed him dead on the spot. (50)

2. What finally happened to the father?

t. And she bit the man on top of his head

u. and killed him dead on the spot. (51)

To be accurate and according to Labov's narrative syntax, the resolution of the present narrative can be s and u. the syntactic structure of both of them is simple.

Coda

If we consider the title 'The Result of Greed 'and the first paragraph as a starting point of present narrative, then we can say that with the death of the shepherd. The story comes back to its starting point and all the questions are fully answered as far as Labov's six element narrative syntax is concerned. Syntactically, the narrative does not end with a free clause but with narrative clause which is u, as listed above. Thus one can say that it lacks a complete or a one-to-one coda.[1]

2. 'The King and Fate'

Abstract

Like the previous folktale, the title, 'The King and Fate', and the first sentence of the first paragraph, *they say* represent the abstract element of Labov's narrative syntax. The narrator uses the present simple tense verb '*say*' in the independent clause of the first sentence and the past simple tense verb '*was*' in the dependent clause.

They say that long ago there was a king. (Tofiq 2005:69)

Thus, we can say that this first sentence is a bridge between past and present and takes the reader or the listener to a journey of a king's tale. This sentence can also be regarded as the whole tale's preface.

Orientation

In this tale, the elements of orientation section are mentioned at the very beginning. The questions who, what, how, where, and when are answered at the very outset of the tale. Despite this, we also may see elements of orientation here and there later in the story, as the scenes require that. Thus we can say that main elements of orientation are in their own actual locations while others are delayed.

The story opens with a statement that *long ago there was a king*. This free clause gives information about when (through the adverb of time, *long ago*) does story happened and who (through the noun phrase, *a king*) is involved with it. Then it gives other pieces of information that represent orientation. Here reference is made to some of them:

- His (i.e., king's) wife, his son, his daughter, his vizier, his retinue and escort (representing who? in Labov's syntax)
- The king's palace, his daughter's room (where?)
- in secret, With feigned reluctance (how?)

(Tofiq 2005:69-70)

Each of the above provides information about person, time, place, and behavioral aspects of the tale.

As the story goes on other persons, times, and places are mentioned as in:

> **Now the poor girl**, left **all alone**, traversed **field** and **plain**, **traveling** several days and nights, and her clothing was ripped and shredded by thistles and thorns. **One evening** she went into a patch of wild straw berries to rest. **The next morning**, **by chance**, **a prince** arrived **with a lot of dogs** to hunt. When the dogs got **near the**

[1] In some Kurdish folktales, especially the ones re-narrated and collected by Mawlud (2012), the coda can take a fixed form. The narrator also ends his story with "*Crashm dra u heechishm penabra*!" (I have my shoes torn, and benefited nothing). In such tales, the coda is very clearly stated.

> **patch of strawberries**, they started **yelping** and **baying**. "There must be something here," the prince said to himself. When he went forward, he looked and saw a beautiful young woman curled up**,** but **she was wearing torn and tattered clothes.** "What are you?" he asked. " Are you **a demon**? **a fairy**? **a human being**? or what?"
> (Tofiq 2005:70)

In the above extract, the items in bold face all represent elements of orientation. The adverb of time *now* and the noun phrases *one evening* and *the next morning* are all to show when the events they accompany took place, functioning as an adverb of time. The reader might think that *now* is for present tense not past. This is right but *now* or we can say present tense markers can be used in narrative discourses or texts for giving vividness to the events taking place, as it does in the present scene[1]. The noun phrases *the poor girl, a prince; the dogs, a demon, a fairy* and *a human being* are providing who and what elements to the story. In the same token, *field* and *plain* are for giving an answer to where question. And *all alone* and *by chance*, and *with a lot of dogs* show the manner of the verbs each of them accompanies. It is worth mentioning that the verbs in progression, i.e. *–ing form,* also serve as orientation markers (Labov 1972:364). The prepositional phrase *near the patch of strawberries* is another cue of *where* element in Labov's orientation.

Complicating Action

The narrative clauses in the present tale, which are the main part of a tale, are numerous. We can say that the first sequence of two clauses which are temporally ordered are at the very beginning of the tale narrating that the kings wife dies:

a. His wife died
b. and left him with a son and a daughter.

(69)

As it is apparent from these two clauses that the death of the king's wife happened firstly and then leaving the king and her son and daughter alone happened as a result of it secondly. The first action caused the second action.

Other narrative clauses will be:

c. All provision for the king's journey were made,
d. and he set out with his retinue and escort.

From the present sequence of these two clauses, one can say that c is prior to d not only structurally but semantically as well. If we change the order of these two narrative clauses and say *He (The king) set out with his retinue and escort, and all provision for the journey were made,* it will, though syntactically nothing is wrong with it, be semantically illogical, while the other way around is both syntactically and semantically is perfect. The same is correct for the rest of the following narrative clauses:

e. The prince took the cloak from his back
f. and gave it to her.
g. She put it around her shoulders
h. and came out of the strawberry patch.
i. The prince said to his father, "I want you to marry me to this girl. Although she is a servant in our house, she is an intelligent and educated woman."
j. and he married the girl to his son.
k. After a year God gave her a son
l. and she became even more beloved.

[1] The use of present tense and present indicators in narrative is a very important technic and dramatic feature to the scenes of the tales and it is known as *historical present*.

Like a-b and c-d, the same relation exists between each of e-f, g-h, i-j, and k-l. The syntactic structure of the clauses of 'The King and Fate' is simple, with the only exception of the *i* clause, which will be topic for evaluation section. In all of the narrative clauses, the only tense which is used is past simple. Thus, the narrative clauses are in accordance with Labov's narrative syntax.

Evaluation

In the current tale, the evaluation elements are found everywhere and the narrator uses various means by which the points of the story are cleared and the Labov's" *So what*?" question is answered. The narrator, like the previous narration, makes use of both external and internal evaluative devices.

As usual, first we will explain the external devices. The situations and events where the narrator suspends the series of the stories, and uses external evaluation are mainly the following:

- The king decided not to marry again **so that his children would not be subjected to a stepmother.**(69)

Here the narrator, through the free clause in bold face, explains and comments why the king decided not to marry another woman. Labov (1972: 392) calls such evaluative device "explicative". In the Kurdish society, it is known that a stepmother is not kind with her stepsons and stepdaughters. Another direct and external evaluation is apparent in the free clauses of the following extract:

- A few days passed. The vizier had a desire for her, and one day he attacked her in secret and said, "I want you to lie with me. If you don't agree to do it, I'll come up with a plan that will make your father cut your head off!"^"Vizier," the girl said, "you are in my father's place. Why are you saying these things? My father has entrusted me to you for safekeeping, "**These words had no effect on the vizier**, **who kept insisting**. **There was nothing the girl could do but force him out**,and she never again allowed him to come there.
  (69)

Here the narrator tells the narratee or reader how lusty the vizier was towards the king's daughter while he had been entrusted by the king that means he was in the place of her father, but he commits treason against his king. One more direct evaluation will be:

- Now the **poor** girl, left **all alone**…..
  (70)
- **He** (the tea maker) **was a really good worker and pleased the king highly**.
  (71)

The narrator also uses other devices by which indirect or embedded evaluation is made from the beginning up to the end of the tale. The outstanding device of this purpose is the use of direct speeches; the narrator comments the events via the characters' speeches as in:

- The king had completed trust in his vizier, and therefore he summoned him and said, "**I'm going on the pilgrimage, and I'm taking my son with me, but I am going to entrust my daughter to your safekeeping**."
- "**Your Majesty**," the vizier said, "**your daughter will be like my own. You go, and Godspeed.**"
- A few days passed. The vizier had a desire for her, and one day he attacked her in secret and said, "**I want you to lie with me. If you don't agree to do it, I'll come up with a plan that will make your father cut your head off!**"

- "**Vizier**," the girl said, "**you are in my father's place. Why are you saying these things? My father has entrusted me to you for safekeeping**."
- With feigned reluctance the vizier replied, "**Your Majesty, what can I say? This daughter of yours wouldn't heed me, and she indulged in all sorts of lasciviousness, turning her house into a house of ill repute to which all and sundry had access**."
- When they came to a spring, the brother said, "**My good sister, I know you are purer than a rose petal. Therefore I am not going to kill you. I'm going to set you free here. Go wherever you like.**"

(69-70)

Through the above quoted speeches the narrator comments on the fact how disloyal, untrue, treasonable the vizier was towards the king and his daughter while the king considered him trustworthy. The narrator also declares that king's daughter is innocent and the vizier is a slanderer. At the end of the story, when the king's daughter disguises herself pretending to be a tea maker, narrates her own adventures, all of her narration is in direct speech (see pages 72-73 from the story).Such types of embedded stories, i.e., stories within stories are good evaluative device by which a narrator can assess the events and they also elongate the story events. Another point is that the embedded narrative can also be studied separately according to Labov's syntax and it contains all the six elements of a narrative. Here, we just refer to the opening sentences:

- "Your Majesty," he said, "**they say that once upon a time there was a** king whose wife died, and he was left with a son and a daughter. The king did not marry again, and the boy and girl grew up. Then the king went on the pilgrimage, taking his son with him, and he placed his daughter in the keeping of his vizier. After the king departed, the vizier desired the girl and wanted to rape her, but the king's daughter escaped." At this point the king pricked up his ears and said, "Be quick, my son, and tell the end. This is just like something that happened to me." The tea maker said, "King, this is a story. **Listen and you'll find out what the end is**." Then he continued and said, "When the king returned from the pilgrimage, the vizier went out to greet him and slandered the girl. The king ordered his son to go take his sister far from town and cut her head off."

(72)

Another linguistic device for indirect evaluation is the use of negatives and hypothetical expressions. Some examples are:

- The king decided **not to marry** again so that his children **would not** be subjected to a stepmother. (69)
- Hearing these words, the king went mad with anger and, on the spot, ordered his son to take his sister far from town, cut her head off, and bring her blood-drenched clothes back because the king **did not want** to lay eyes on his evil daughter. Although the prince knew that his sister was pure and **had not done any such thing**, there was **nothing** he **could** do but obey his father's order. He went to his sister and explained the situation to her.(70)

- The man agreed. **No sooner** was she outside than she started running as fast as she **could**. Some time passed and the woman **did not come back**. The man went outside and searched this way and that. **Neither**

could he find any trace of her **nor did** he know in which direction she had gone.(71)

According to Labov's syntax, all the negatives and modals, *not to marry, would not, did not want*, *had not done any such thing*, *nothing*, *could*, *did not come back*, and *neither could…no did,* in the above extracts are showing that the narrator comments on the context around which the negatives and modal verbs occur.

The use of questions is also one of the devices by which evaluation is performed, as in:

- When the vizier came before the king and kissed his hand, the king asked, "**Vizier, how is my daughter? During my absence have you taken good care of her and watched over her?**"

  (69)
- "**What are you?**" he (the prince) asked (the king's daughter). "**Are you a demon ?a fairy? a human being? or what?**"

  (70)

Many intensifiers have also being used for evaluating various situations and events. Some of them are:

- **All** provision for…
- the vizier and **all** people of the town (69)
- **all** sorts of lasciviousness
- the girl left **all** alone…. (70)

In the present narrative some imperative expressions have been utilized to provide assessment and comment on the events and this is again a fruitful device in Labov's syntax for evaluation element. The followings are example for such device:

- "**Don't lie** to me,"
- "Get out of my sight"
- "**Get out**, you filthy cur!"
- "**Go**, and God be with you."
- "King, this is a story**. Listen** and you'll find out what the end is."
- **Let's** go back to the adventures of the woman.

(71)

Religious rituals also play an important role in providing cues for embedded evaluation as far as Labov's narrative syntax is concerned. In the current narrative, like the previous one 'The Result of Greed', the narrator refers to some terms like, going to pilgrimage, the dervish and drum (known as *darwesh* and *daffa* in Kurdish Language). Other examples of ritual expressions are:

- "**By God**" she answered, "I'm not a demon or a fairy. I am a poor wandering woman, and I want to find work with some decent person and make my living."

  (70)
- How far she went no one but **God knows**, but she came to her father's own city.

  (71)

In Labov's narrative syntax, the use of correlatives such as *be…ing* even the appended participle, *v-ing* alone, which shows that an action coincidently occurs with another, is an external evaluative device (Labov 1972: 387-88). Examples of correlative in the present tale are:

- Hearing these words, the king went mad…
- **Weeping**, the girl followed her brother out of town.
- When the dogs got near the patch of strawberries, they started **yelping** and **baying**.

(70)

- The next day she came across a farmer **working** in a field.(71)

Such use of the correlatives can serve to suspend the listener or reader get ready for another action to happen and as a result the narrator evaluates the events.

At the very end of the story, and more accurately to say, after the king's daughter finishes her adventurous experience, the narrator suspends the narrative and comments on the reaction of the personal narrative of the tea maker by saying:

- The king was overcome with grief, as his head spun as a result of this story.(73)

Till this point, the narrator has been evaluating the narrative events by different devices referred to throughout this section, and by the end of the last extract the evaluation section ends and we will come to the resolution section.

Resolution

According to Labov's narrative syntax, the last narrative clauses come exactly after the evaluation element ends. In this case, the following narrative clauses represent the resolution element for the 'The King and Fate':

m. The tea maker took off his turban,
n. and abundant long hair spilled out.
o. "Father," she said, "I am your daughter, and that dervish is my husband. That groom is the traitor to my husband who killed my infant son, and this is the vizier who slandered me."
p. at the king's command, the vizier and the groom were beheaded.

(73)

The above narrative clauses, in Labov's sense, provide an answer to "*what finally happened*?" and syntactically the structure of these clauses, m-p, like the narrative clauses of the complicating action section, is simple.

Coda

The final narrative clause p tells us what exactly happened after the maker tells his story and discloses himself as the king's daughter. The listener might still want to know more about the rest of the royal family. Thus the narrator continues and says:

- … and the king's daughter, her husband, her father, and her brother rejoiced in each other.

Through this simple sentence the narrator ends the story up and brings the narratee and reader to the point where s/he started telling the story of the king's family and their fate. All the five questions in Labov's narrative syntax can be fully answered. This final sentence is similar what Black (2006:40) emphasizes that a code includes a sentence like *and they lived happily ever after.* Accordingly, we can say that this end of this tale has a very typical coda, as it:

1. Gives a complete closure to any further questions and at this point we can realize that all five questions are fully answered.
2. Brings us, as listeners and readers back to the present time, by knowing the destiny of the king's family.
3. Tells us that the bad is punished and the good is rewarded!
4. Gives us a lesson that the treason and disloyalty, no matter how long it is concealed, one day will be divulged!

At this point, we can say that Labov's syntax is highly related to the semantic and pragmatic aspects of that narrative as well because this model does not only concern the mere syntactic surface structure but it also deals with the logical and deep structure of the narratives.[1]

[1] Thus we can say that the narrative texts have deep structure and surface structure as Noam Chomsky asserts that the sentence syntax has such structures.

3. 'Strike, Strike, What You Saw Is All What You Get'

Abstract

Like the other two previously scrutinized folktales, this tale has a very simple sentence within the first paragraph representing the abstract cue in Labov's narrative syntax:

> **They say that once upon a time** Sultan Mahmud disguised himself by putting on dervish clothes and went out to roam around the market and lanes of the city.
> (73)

Via this paragraph, narrator drags the attention of the listener and reader to be aware of the fact that a story is about to be told. The part which is in bold is a common abstract marker in most of the Kurdish folktales, and the in present simple tense in *They say* and the fixed expression *once upon a time* provide a bridge between the present moment and the past events of tale. Another point about the first sentence in the first paragraph is that it sums the whole narrative up. Thus, abstract is fully found and well provided in the current narrative.

Orientation

The orientation elements found in this tale are few, especially the persons element, because of the tale's being short in comparison to the previously scrutinized one. Despite this, there are ample elements to meet the needs of the orientation in Labov's sense.

After the abstract of the story, the narrator relates:

> Sultan Mahmud disguised himself by putting on dervish clothes and went out to roam around the market and lanes of the city.

This sentence, though in the text, it is a part of a larger sentence, gives information about person (Sultan Mahmud), thing (dervish clothes), and place (the market and lanes of the city) and manner (putting on dervish clothes). And these are all orientation elements. Another orientation cue in the sentence is the –ing form of the verb put, *by putting on*.

As the story goes on, the narrator gives further orientation information and introduces further characters. In the second sentence,

> By chance, he passed by a blacksmith's shop, and he listened in, somebody inside was pounding away at something and saying, "Strike, strike, what you saw is all you'll get." The sultan, perplexed by these words, said to himself, "I have to find out what is the secret of these words."
> (73)

The blacksmith's shop, pounding, and *saying* are all orientation markers. In the second paragraph on there is another person introduced in the tale, the blacksmith. At the end of the story, the narrator mentions the sultan's servants twice, earlier to this the mention of the beggar is also a cue. Thus, all in all, the orientation is well provided for this tale.

Complicating Action

The first narrative clause in this narrative is in the first sentences of the first paragraph:

a. Sultan Mahmud disguised himself by putting on dervish clothes
b. and went out to roam around the market and lanes of the city.

The clauses *a* and *b*are temporally ordered; first Sultan Mahmud disguised and then he went out. Other narrative clauses *c* and *d*, like *a* and *b*, are marked by simple syntactic structures are:

c. he (Sultan Mahmud) knocked at the door,

d. the blacksmith opened it for him.

The rest of the verbs of clauses in the current tale that relate the exact events are in simple tense and they are simple in their syntactic structure. The narrative continues with following narrative clauses:

e. "I'm a poor wayfarer," the sultan said, "Maybe you could let me stay the night."
f. "Of course," the man said. "Please come in and be my guest."

One might say that this pair, *e* and *f,* seemingly do not consist of two but more than two clauses. But in actuality every quoted speech stands for a narrative clause (Schifrin 1981: 46). Besides, every speech performs an action as far as Austin's speech act theory is concerned. In the same token many similar narrative clauses to *e* and *f* are found in the rest parts of the story. Suffice to say that all of these narrative clauses prove that there are enough clues of complication action elements in the story under scrutiny.

Evaluation

Unlike the other two tales, the present story contains only one type of evaluation. It almost completely lacks the external evaluation. It only contains the internal one. The narrator does not evaluate the tale himself directly but via the speeches or the actions of tales characters indirectly. Through these evaluative devices the narrator comments on the events.

As an internal evaluation element, intensifying and emphasis is one of the effective devices in Labov's narrative syntax. Labov (1972: 379) thinks that repletion is though simple in a syntactic point of view but effective as it intensifies and suspends the actions. In the current narrative, the title, 'Strike, Strike, What You Saw Is All You'll Get' has been repeated several times in the story parts: in the beginning, middle, and even the story ends with this expression. Thus, the narrator wants to say that this expression carries the complete meaning and theme of the tale. Within this expression we also have the repetition of the word *strike*.

In this same expression there are two other internal evaluation devices: the use of imperative mood and present and future tense. The verb 'strike' is used as an imperative. The verbs *is* and *will* contracted in the text as *'ll* can be cues for an evaluation.

The title can also be regarded as a direct quotation and direct quotations can be a device for evaluating the event. The narrator here indirectly wants to say that is in vain to get worried much about your worldly life and you cannot, like the blacksmith, change your destiny as it is prescribed by God.

Non-assertive expressions, negative and question have been also used in the story as in the following extracts:

- Sultan Mahmud **couldn't** keep himself from asking, "If it's **not** impolite, sir, **what do these words mean?**"

(73)

- But it **didn't** do any good. Sultan Mahmud **wouldn't** leave him alone.
- It **wasn't** long before a beggar knocked on the door and asked for charity.

(74)

The dream of the blacksmith and his comment can also be, indirectly, an embedded evaluation:

> "Brother," he said, "these words I say are the result of a dream I had. One night in a dream I came across a mountain. I looked and saw that the mountain was full of holes, and water was coming out of the holes. Water was gushing out of some of them, but it was only dribbling out of others. Then I saw an Arab man bathed in light.
> 'My friend,' he said, 'these are the destinies of people. Everyone who has a lot of water here has a great destiny earmarked for him and consequently is rich.

> Everyone whose water is scanty here has little destiny and a poor,' 'All right,' I asked, 'where is mine?' He took me by the arm and led me to a rock in which there was a crack. A little water was oozing out of the crack. 'This is your destiny,' he said.
> "When I woke up realized that all my effort was in vain. What had been fated to me was all would get. Many times I worked all day without making any money. For a long time now I have taken that dream to heart and realized that I am a poor and am not going to get any richer. That's why I have made it a custom to repeat those words."
>
> (74)

This dream is an evaluation because:

(1) it gives the reason why the blacksmith repeats these special words;
(2) it is quotation; and
(3) it is flashback for what had happened and foreshadowing what will happen in the end. Labov (1972) considers flashback (and foreshadowing) as evaluative device(s).

The narrator, through the blacksmith's comment wants to say that humans cannot gain in life more than what is fated or destined by God, and this fact has been reinforced throughout the whole tale, from the title to the very end. This can also be regarded as an indicator of ritual belief which is again a clue for internal evaluation. Another ritual concept is the sultan's disguise as dervish twice in the story.

Resolution

As far as Labov's syntax is concerned, the resolution element of the current tale is when Sultan Mahmud went to the blacksmith's home for the second time to check why he is still repeating the same words. Thus the following narrative clauses indicate the end of the story:

g. The sultan was very surprised by this,
h. and that night he disguised himself in dervish clothing
i. and went to the blacksmith.
j. The sultan sat down.
k. Finally he asked, "Did they send you a gift from the sultan's house? A few days ago they put a roasted chicken on brass platter and sent it."
l. "Yes," he said, "they sent me the food, but a beggar came to me, and I said to myself, "I've eaten a crust of bread. I won't eat this; I'll give it to the beggar."
m. In utter astonishment Sultan Mahmud said, "It's true, whatever is fated comes to be." Then he said, "Dear sir, I am Sultan Mahmud, and that chicken I sent you was stuffed with money. God didn't fate it to you. It's clear that your dream was true, and you're right to say, "Strike, strike, what you saw is all you'll get."

(74)

Like the other narrative clauses, there is a logical or sequential relation between the clauses g-m. For example the clause *g* happened first then clause *m*. We can even say that there is a causal relation between the two as well; the first action caused the second to happen. For the exact answer for `*what finally happened*?*,* we can say that *m* narrative clause is the only right clause to do carry the answer.

Coda

In narrative syntax of Labov, the coda functions as an indicator of the full end of the story and coda takes the reader or listener to the point where the narrator started the story for the first time. Accordingly, we can say that because the current story starts with "Strike, Strike, What You Saw Is All You'll Get" as it is title and strangely the story ends with the same expression. Thus the listener or reader has been taken back to the point where the story started first. Another proof is that the lesson that we can learn from the tale is clarified and presented in *m* clause.

4. Conclusion

The study concludes what has been hypothesized that Labov's syntax elements, abstract, orientation, complicating action, evaluation, resolution and coda are all available in the three Kurdish folktales. This does not mean that all the tales have the same linear structure. It is true that all elements of Labov's elements are found in the tales but they do not have similar order, specially the evaluation because it has been scattered over the rest of the other five elements. As it has been seen in the analyses of the complicating action sections of all the three tales, the syntactic structure of the narrative clauses is very simple and absolutely meets Labov's pattern and condition of clauses that tell tales. In the analyses of these three narratives, it has been also concluded that Labov's narrative does not only pertain the mere surface syntactic structure of the tales but the deep syntactic and semantic structures of the elements in general and of the evaluation and coda elements in particular.

References

Abdulla, I. (2011). *Haqayat u afsanay millatan* (*The folktales and legends of the nations).Erbil: Ministry of Culture and Youth Press.*

Black, E. (2006). *Pragmatic stylistics*. Edinburgh: Edinburgh University Press.

Crystal, D. (2008). *A dictionary of linguistics and phonetics* (6thed.) Oxford: Blackwell.

Labov, W. (1972). The transformation of experience in narrative syntax. In Labov, W. (Ed.), *Language in the inner city: Studies in the Black English vernacular* (pp. 354–396). Philadelphia: University of Pennsylvania Press.

Mawlud, A. Kh. (2012) *Afsanakan wa degêrnawa: komala afsana u haqayatkê kurdawarya* (*As the legends narrate:A collection of Kurdish legends and folktales*). Erbil: Rozh-halat Press.

Schifrin, D. (1981). Tense variation in narrative. *Language*, *57*(l), 45-62.

Thompson, S. (1977). *The Folktale*. California: California University Press.

Tofiq, M.H.(2005)'The Result of Greed'. InTofiq M.H.(2005). *Kurdish folktales*. (pp 50-51). Suleimani: Ministry of Culture Translation House.

_____'The King and Fate'. In Tofiq M.H.(2005). *Kurdish folktales*. (pp 69-73). Suleimani: Ministry of Culture Translation House.

_____'Strike, Strike, What You Saw Is All What You'll Get'. In Tofiq M.H.(2005). *Kurdish folktales*. (pp 73-74). Suleimani: Ministry of Culture Translation House.

Trask, R.L. (2007). *Language and linguistics: The key concepts* (2nd ed.).New York: Routledge

رستەسازی گێڕانەوە لە چیرۆکی فۆلکلۆری کوردییدا

پوختە

لەرۆژگاری ئێستادا، شیکردنەوەیبونیادی گێڕانەوەیی بۆتە یەکێ لەو بوارانەی کە گرنگییەکی زۆری لەلایەنە جیاجیاکانی ماریفەوە پێدەدرێت، گوتاری گێڕانەوە دەکرێت لە ڕووی ئەدەب و زمانناسی و زمانناسی کۆمەڵاتی و دەروونناسی و پزیشکایەتی و هتد شیبکرێتەوە. ئامانج لەم باسە بریتییە لە شیکردنەوەی بونیادی گێڕانەوەیی سێ چیرۆکی فۆلکلۆری کوردی لەڕووی ڕستەسازییەوە، بەوپێیەی کە ئەم لایەنە بەیەکێك لەو ڕێسا بونیادنەرانەی کە پێکهاتەی گێڕانەوەیی دادەندرێت کە ئەم چیرۆکە فۆلکلۆریانەی لەسەر بونیادنراوە، بەڵام بەداخەوە لەڕووی توێژینەوەی ئەکادیمیەوە گرنگی ئەوتۆی پێنەدراوە.

بەمەبەستی هێنانەدی ئەم ئامانجە، سێ چیرۆکی فۆلکلۆری کوردی بەناونیشانەکانی: ('The Result of Greed'**سەرئەنجامی تەمماع**) و ('The King and Fate'**پادشا و چارەنووس**) و ('Strike, Strike, What You Saw is All What You Get'**بیکوتە، بیکوتە، ئەوەی بینیت هەر ئەوەندە وەردەگری**) بەپێ بیردۆزە ڕستەسازییەکەی لابۆڤ شیکراوەتنەوە. لەسەرەتادا، بەپێی گریمانەی توێژینەوە، دەکرێت بونیادی گێڕانەوەیی ئەم چیرۆکە فۆلکلۆریانە ئەم بەم بیردۆزەی لابۆڤ شیبکرێنەوە، لە کۆتایی دا، دەرکەوت کە دەکرێت ئەم مۆدەڵەی لابۆڤ بە ڕستەسازی گێڕانەوە بۆ چیرۆکی فۆلکلۆری کوردییدا دابندرێت هەروەك چۆن بەرستەسازی گێڕانەوەیی گێڕانەوەی سروشتی(واتە: زارەکی)دانراوە.

نحو السرد في القصص الشعبية الكوردية

الملخص

ان تحليل الخطاب السردي اصبح مجالا مثمراً في مختلف مجالات المعريفي. من المستطاع ان يدارس السرد عن خلال الادب و اللسانيات و الاسلوبية و علم اللغة الإجتماعي و علم النفس و الطب والخ.... و يهدف البحث الحالي الى تحليل التركيب السردي لكل من ثلاث قصص الشعبيةالكوردية من ناحية نحوية، لأنّ هذا الجانب من جوانب القواعد التركيبي التي تتبنى عليها القصص الشعبية الكوردية لم تأخذ بعين الإعتبار بشكل ملحوظ لدى الباحثين الاكاديميين حتى الآن.

لتحقيق هذا الهدف، تم تحليل ثلاث قصص شعبية كوردية، ('The Result of Greed'نتيجة الطمع) و ('The King and Fate'الملك و القدر) و ('Strike, Strike, What You Saw is All What You Get'إضرب، إضرب، الذي رأيته هو كل الذي تأخذ)حسب نحو او نظرية السرد للابوف. و إفترض الباحثان بانه من المكن تحليل تركيب السرد لهذه القصة الشعبية الكوردية حسب نحولابوف.في النهاية وصلت الدراسة انه من الممكن ان تعدنظرية لابوف نحواً للقصص الشعبية الكوردية كما هو حالها للسرد الطبيعي (الشفهي).

The Possibility of Adopting Zero - Based Budgeting by Kurdistan's Private Universities: Nawruz University as a Case Study

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Abstract
Zero-Based Budgeting (ZBB) is a way of budgeting in which all expenditures must be justified and started from zero-point every year. The purpose of this study is to find out the possibility of using Zero-Based Budgeting (ZBB) by private universities based in Iraqi Kurdistan Region. The study sample is University of Nawruz as a private university based in Duhok City .The research explored that there is a possibility of using Zero-Based Budgeting (ZBB) by the University of Nawruz , owing to the fact that the University has an efficient accounting system and administrative staff which may contribute to adopt this method of budgeting. Furthermore, the top management at the university supports using this method of budgeting to rationalize costs and improve activities performance as well, although, the concept of Zero-Based Budgeting (ZBB) and its application could be considered a new experience for university's staff.
Keywords: Zero-Based Budgeting, Traditional incremental budgeting.

1. Introduction

Zero-based budgeting is a method used by organizations, companies, governments and policy makers in the process of budget planning, decisions making and more effective use of available resources (Fong & Kumar, 2002). In contrast to traditional incremental budgeting , under zero based budgeting system each budget item requires to be prepared and justified by division managers from zero point , rather than using most recent year's budget as a base of budgeting (Bunce et al. 1995).

Zero-based budgeting has become one of the most tools of planning since 1972 (Burrowa & Syme, 2000) .Zero -based budget budgeting was first introduced in the State of Georgia in 1972 by Jimmy Carter and subsequently to the Federal Government of United State of American in 1976 (Correia, Langfield, Thorne & Hilton . 2008) . It has been developed as a managerial technique in order to control expenses and efficient allocation of resources (NCSL, 2010).

All types of enterprise can benefit from the process of budgeting in the planning, controlling, decision making and operating activities (Garrison, Noreen, & Brewer,2006) . The budget process helps to set out the bases of predicting all expenditures and revenues of companies for the specified time through many methods (Gopal, 2009). Consequently, budget can be used as a managerial and financial technique to prioritise and ordinate cost and resources of organization, since it expresses all activities in quantitative terms (CIMA, 2008).

Zero based budgeting offer a better allocation of organization's resources than traditional incremental budgeting, it is not based on actual data of previous years; it starts from zero point of every function costs and requirements within organization, regardless of whether the budget is a higher or lower than the last year (Gopal, 2009 , Snell, 2009).). As a result, it can be used by manager in order to allocate resources of organization more effectible and achieve company's main goals (Hilton, 2005)

2. Literature Review

2.1 Zero- Based Budgeting Concept

Zero-Based Budgeting has been discussed by many researchers over the past years .The discussion started since when it was first used by its prominent Jimmy Carter as the Governor of Georgia State, while trying to reform federal budgeting system (Correia et al . 2008). The early definition of Zero - Based budgeting was by Pyhrr (1973) as ZBB is a way of preparing the annual budget by any kind of organizations beginning from zero point , all companies functions were obliged to be justified in detail in order to be funded by budget .

It has been defined as well by Horngren, , Foster , Datar , Gray (1996, p .492) as " budgeting from the ground up as through the budget were being prepared for the first time, every proposed expenditure comes under review".

It is also point out by Arnol and Turkey (1996) that Zero-Based Budgeting is a managerial and financial tool which obligate all department function to review comprehensively all expenditures instead of only increasing. Under ZBB system each departments' manager has to rationalize the budget request in full detail starting from the Zero-base whether the budget is increasing or decreasing in comparison to previous year.

Furthermore, Collier (2003) defined Zero- Based Budgeting as " A method of budgeting that ignores historical budgetary allocations and identifies the costs that are necessary to implement agreed strategies".

According to Chartered Institution of Management Accountants (2008) ZBB is "an operating planning and budgeting process which requires each manager to justify the entire budget request in detail and shifts the burden of proof to each manager to justify why he/she should spend any money. This procedure requires all activities and operations be identified in decision packages which will be evaluated and ranked for the of importance of systematic analysis".

In conclusion, Zero - based budgeting has been defined many times as mentioned earlier. The definition of Chartered Institution of Management Accountants (2008) can be adopted in this research because it gives more details about the concept , purpose and process of ZBB than other definitions.

2.2 Advantages of Zero-Based Budgeting

The key benefit of Zero-Based Budgeting is that its first focus is on the actual funds which are needed to fulfil specified level of output instead of increasing or decreasing budget according to the past data (Allen, 1978). Below there are a set of these benefits:

1- Accurate allocation of resources: as it is known in economic resources are scarce. As a result Zero -based Budgeting technique encourage efficient allocation of resources in accordance to needs and benefits (Gopal, 2009).

2- Regular evaluation: under Zero -based Budgeting system every year every function manager has to rationalize the request for funds. Thus, evaluating different programmes and activities of organizations in regular way meaning there is no difference between the new project and ongoing project from the view-point of Zero -based Budgeting system (Gopal, 2009)

3- Associates budget with the objectives of organization to help to achieve the main goals of organization through funding essential activities only. In other words, those activities which do not fit within the main objectives of organization are not funded any more(Gopal, 2009).

4- Improve communication and coordination of enterprises through encouraging collaboration among companies' department and staff, as well as prevents conflict among departmental managers and drives function manager to find effective methods to improve operations (Warren, 2005).

5- Less time consuming: Zero -Based Budgeting system can be prepared quickly and easily to more junior members of staff. As well as, it is easy to understand (Chinaacc, 2013)

6- It provides top management a large number of budget choices in terms of varying levels of services and production function (Stonich, John, Kirby, Howard and Weil,1977)

2.3 Weaknesses of Zero-Based Budgeting

Despite of the fact that the Zero-Based Budgeting has many advantages over any other budget methods in use , only few government organizations have succeeded in implementing it since 1970s .Due to the fact that the complete implementation of Zero-Based Budgeting is not an easy job (shelby, 2013) . Therefore, it may suffer from the below limitations:

1- Zero-Based Budgeting may not be used properly, because the activities choice for the purposes of budget based on the traditional functional department (The Institute of Chartered Accountants of India, 2013).

2- When prioritize programs and activities, conflicts may occur between cost analysis and political considerations, although, projects and activities are regularly renewed and may not based upon the underlying value of those projects and activities (Gopal, 2009).

3- Zero - Based budgeting is restricted only to top management in organization. In other words, the lower level managements are not allowed to take part in the planning budgeting. Hence, it will influence the commitment of organization to the rest of employees (Khandelwa, 2003).

4- Decision units and decisions packages may not be easy to define and it is also considered to be time consuming and exhaustive process. Owing to the fact that every item of expenditure has to be justified in details and in order to be understood and implemented successfully. It is obligated to train managers for this purpose (The Institute of Chartered Accountants of India, 2013).

5- At the beginning of ZBB process policy guidance and regulations are needed to be provided to decision makers to avoid political conflicts that may occur later (Shelby, 2013).

2.4 Step Involve in the Preparation of Zero- Based Budgeting

Zero- Based Budgeting as a process aims to review and re-evaluate the whole organization's performance and activities every year through reviewing total cost, levels of services, and revenue protections within budgetary plans. This process goes through following steps (Collier, 2003).

1- Determining the aims**:** The first step in Zero- Based Budgeting is determining organization's goals. These objectives could be efficiency use of resources, reducing cost, removing activities and program that less benefit for organization

2- Scope of Coverage: This step is about the areas of implantation of ZBB. Enterprises must selected areas for applying it whether all areas or specified areas on trail bases.

3- Developing Decision Units**:** Decision Units can be defined as a cost centre such as functional departments, Services departments, a programme, a product-line .In order, to take into consideration decision units should be specified activities which can be independent and evaluated.

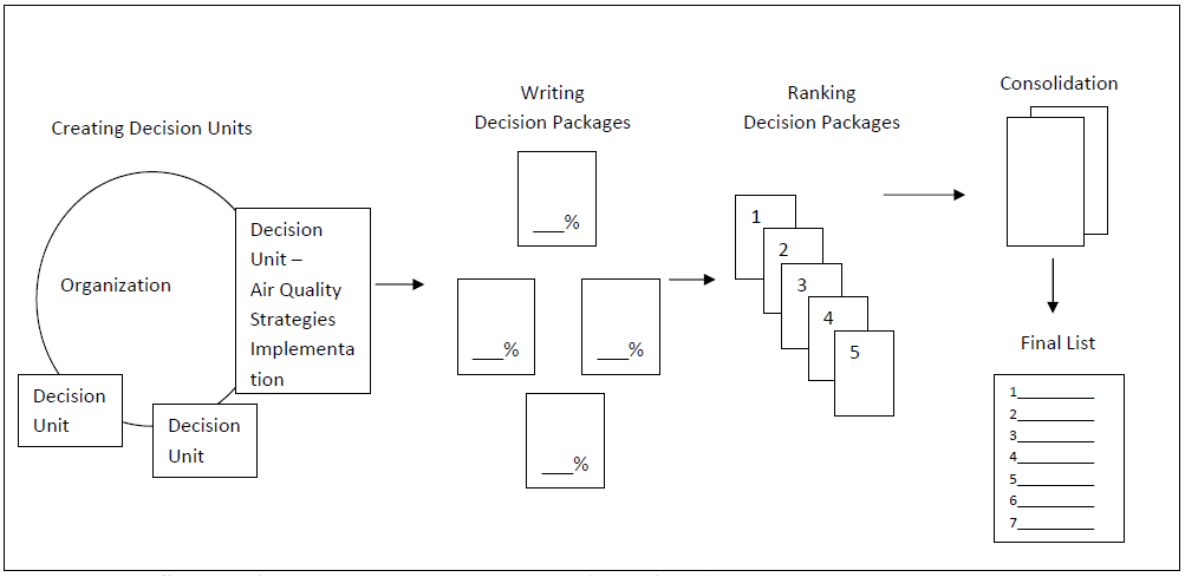
4- The benefit-cost analysis: This is very important step in Zero- Based Budgeting. Benefit of any activity must be compared to the cost of that activity, if it is positive the activity can be implemented, otherwise may be removed.

5- Identifying Decision Packages: Decision Packages are the main step of Zero- Based Budgeting. The aim of identifying decision packages is to evaluate activities and alternatives to be achieved by concerned manager for funding.

6- Ranking Decision Packages**:** when decision packages are prepared, then they ranks based on the significance and priority order.

7- Preparation of Final Budgets: This is the final step involved in ZBB process. After, all activities and programme are ranked by higher management level, resources are then allocated to these activities and budget approved.

Figure. 1 Process of Preparation Zero- Based Budgeting



Source : General (1979.p.3) and Shelby (2013.p.10)

2.5 Differences Between Traditional and Zero -Based Budgeting

Traditional incremental budgeting can be defined as method of preparing annual budget by taking into an account the previous years' data or actual performance as a base. It is started with actual budget for the last year and then adjusts it whether increasing or decreasing to reflect changing for the new year (Bunce et al. 1995). While, Zero- Based Budgeting ignore the previous year data or it is not based on historical data. Under zero based budgeting system each budget item requires to be prepared and justified by division managers from zero point , rather than using most recent year's budget as a base of budgeting .

Table .1 Differences between Traditional and Zero-Based Budgeting

Traditional Budgeting Vs Zero Base Budgeting		
	Traditional Budgeting	**Zero Base Budgeting**
1. Emphasis	Lays emphasis on ‚How much'	Lays emphasis on ‚Why'
2. Focus	Focus is on increase or decrease in expenditure.	Focus is on ‚cost benefit analysis'.
3. Communication	Communication is, usually, vertical.	Communication is, usually, both vertical and horizontal.
4. Approach	Past is taken for granted and never questioned for continuation.	Past is questioned and justification needed for continuation and fund allocation.

Source : Gopal (2009, P. 424)

3. Research Methods

3.1 Research objectives

The primary objective of research is to identify that there is a possibility of adopting Zero - Based Budgeting by Kurdistan's Private Universities: Nawaroz University as a case study.

In order to achieve the aforesaid aims, the objectives of this research are:
1- To identify the possibility of applying Zero-Based Budgeting by University of Nawruz instead of using traditional incremental budgeting.

2- To recognize problems and obstacles that could face the application of zero budgets by University of Nawruz.

3- To contribute in enhancing the general performance of the University of Nawruz by suggesting to adopt Zero -Based Budgeting.

3.2 Research Importance

This research is important due to the fact that it tries to investigate the possibility of applying Zero-based budgeting by private universities based in Kurdistan , University of Nawruz as a case study. The current research wants to know the university staff awareness and understanding of ZBB , the need of university to adopt , to what extend the top management support using ZBB and existing efficient staff and Accounting system at the University of Nawruz to use ZBB. The results of the study may encourage the Nawruz University to switch from traditional incremental budgeting to ZBB in order to improve allocation of its resources , regular evaluation of its activities , enhance communication and coordination among university's departments.

3.3 Research Questions

Although Zero -Based Budgeting has many advantages over other budgeting methods. Similar to other budgeting methods, Zero -Based Budgeting also does not free from drawbacks such as complexity in applying, time consuming and causing conflict between cost analysis and political considerations.

This research tries to answer the following questions:
1- Is there an understanding and awareness towards Zero - based budgeting by university staff ?
2- Is there a need for University of Nawruz to adopt Zero - based budgeting ?
3- Does the top management of the university support using advanced tools of planning such as ZBB?
4- Does the University of Nawruz has an efficient staff able to employ ZBB?
5- Is there an efficient accounting system at the University of Nawruz facilitate using ZBB?

3.4 Research Data Collection

In order to assess the availability of basic requirements of applying Zero-Based Budgeting by University of Nawruz, Questionnaires are designed to measure the current budgeting situation at the university and the possibility of adopting Zero-Based Budgeting. It can be easier for researcher to achieve the objectives of research, guarantee of more confidentiality and helping participants to give more truthful answer through questionnaire (Burns, 2000).

3.5 Research Sample

The research sample is limited only to the University of Nawruz. Zero - based budgeting is a method of budgeting can be used by public and private organizations. It is an appropriate method to be used by university of Nawruz. The respondents are the staff of university including the top management, deans of colleges, heads of departments, and accountants and almost all of them participated in this research. A total of 30 questionnaire are distribute through hard copy questionnaire , however only 20 respondents are answered the questionnaire.

Table.2 Research Sample Size

Position	Number
President of University	1
Dean of College	3
Head of Department	10
Accountant	3
Administrative staff	4
Total	20

3.6 Research Data Analysis

Quantitative and qualitative data can be used to analyze collected data. Qualitative data deals with data that can be expressed through words, While, quantitative data is mainly numeric used for analyzing data collected by questionnaires in order to find the link among research variables (Saunders et al, 2007). This research is considered quantitative data since data is collected by questionnaires. After the data has been collected by questionnaires from research sample, they are inserted in to Excel Worksheet, and then exported into Statistical Package for the Social Sciences (SPSS). In order to find out the possibility of applying Zero -Based Budgeting by University of Nawruz, both Mean and Standard Deviation are employed and they are both available in SPSS.

3.7 Research Limitations

There are several areas for improvement for future research which could be drawn from current research . The first limitation is the research paper only investigate the possibility of adopting ZBB by private universities in Kurdistan , future research should investigate the same method of budgeting on different industrial. The second limitation is the research sample size this because of geographical location of private university in Kurdistan , future research should expand their sample to include more than on university.

4. Analysis and Discussion of Results

4.1 Background about University

The university selected as a sample of this research paper is University of Nawruz. It is one of the private universities in the Kurdistan Region of Iraq and it is based in Duhok City. It was ranked by Ministry of Higher Education as a second university after University of American in 2013. The University has been established by the Syndicate of Economists in Duhok Governorate on July 20, 2004 with the approval of the prime minister of the Iraqi Kurdistan Region under the name "Duhok University College".

The University of Nawruz started teaching and accepting students in the 1st of December 2004 in according to the decision of the Consultation Committee of the Ministry of Higher Education and Scientific Research number (3/2) .The University of Nawruz kept expanding after it is opening in 2004. In 2009, the University renamed to the University of Nawruz instead of "Duhok University College" in accordance with decision (2854) of the Council of Ministers of the Iraqi Kurdistan Region, dated September 15, 2009. Currently, the University consist of five faculties which are Law and Politics Faculty, Economics and Administration faculty, Computer Science and I.T. faculty, Languages faculty and Engineering Faculty (Nawruzuniversity.com).

The University of Nawruz uses traditional incremental budgeting as tool of planning for future and for more forward - looking. This method of budgeting is criticized by researchers such as all activities and programmes will carry on in future. Moreover, there is no incentive for developing new project and reducing costs. Encourages spending up to the budget so that the budget allocated for the next year. It is also criticized that is lack of flexibility because it does not take into account the change in income (AccountingTools.com). In order to overcome these limitations, this research attempts to find out the possibility to employ Zero- Based Budgeting by University instead of traditional incremental budgeting.

4.2 Analysing Results

Qualitative data enable the research paper to investigate the possibility of adopting ZBB method by the University of Nawruz. The data has been collected by structured questionnaire and then has been analyzed descriptive statistical analysis . Descriptive statistical analysis is a method of analysing both qualitative and quantitative data and it is considered a very useful tool for summarizing qualitative data collected by questionnaire (Marshall & Jonker, 2010).

The results of the research paper have been calculated by Statistical Package for the Social Sciences (SPSS).

Table .3 Previous Background about ZBB Concepts

Variables	Mean	Std. Deviation	N
1- Having previous knowledge about Zero-Based Budgeting concept.	2.8000	1.15166	20
2-Having enough knowledge on using Zero - Based Budgeting.	2.7500	1.06992	20
3- Decision units at the university are clear and identified.	3.9000	.78807	20
4-Ability to find alternative methods and evaluated them.	3.5000	.94591	20
5-There is a knowledge about decision makers procedures at the university	3.7000	1.26074	20

The Table. 3 shows the previous and general knowledge of research participant about the ZBB concepts through five variables. It can be seen from the table that the Concept ZBB and its application is a new concept for research participant with Mean of (2.800, 2.7500) and SD of (1.15166, 1.06992) respectively. While, identifying decision units, decision makers and finding alternatives could be defined by participant with Mean of (3.9000, 35000, 37000) respectively.

Table. 4 The Need for Adopting ZBB by University

Variables	Mean	Std. Deviation	N
6- The current budget system is efficient and distributes resources among university's department accurately.	3.6500	.93330	20
7-All unnecessary activities and expenses are cancelled by the current budgeting system.	3.3500	1.03999	20
8-The current budgeting encourages head departments to participate in budget preparation.	2.8500	1.22582	20
9- The top management works to rational use of revenues and expenses.	3.9500	.94451	20

The table .4 indicate the need of the Nawruz University to adopt ZBB. It can be noticed from the table .2 the University does not need to apply ZBB or change the current budgeting system (traditional incremental budgeting) .Owing to the fact the ability of current budget system in distributing resources accurately, cancelling all unnecessary expenses and seeking of top management to rational use of recourses with Mean of (3.6500, 3.3500, 3.9500) and SD of (0.93330, 1.03999, 0.94451) respectively, Even though the current budget suffers from involving the head of departments in budget preparation with Mean of (2.8500).

Table . 5 The Possibility of Obtaining Top Management's Supporting for Applying ZBB

Variables	Mean	Std. Deviation	N
10-Top management supports bringing advanced technology and scientific tools.	4.2500	.98640	20
11- All management levels at the university are encourage by top management to take part in budget preparation.	3.4500	.94451	20
12-Top management tries to develop skills of administrative staff by opening special courses in this regard.	3.6500	.81273	20

The table.5 point out the likelihood of obtaining top management's supporting for applying ZBB. It would be fair to say that the top management supports bringing advanced technology and scientific tools such as ZBB with Mean and SD of (4.2500 , 0. 98640) respectively. The Variables 11 and 12 also shows the agreement among research participant about taking part of all management levels in budget participant and attempting top management to train administrative staff for the purpose of applied budget with Mean and SD of (3.4500 , 0.94451 , 3.6500 , 0,81273) respectively .

Table . 6 The Existing Efficient Staff to Identify Decision Units and Evaluating Alternatives

Variables	Mean	Std. Deviation	N
13- There are skilful staffs able to identify and analyze requirements of all departments in order of priority.	4.0000	.99472	20
14- Zero - Based Budgeting can be used by university accurately.	3.3500	.93330	20
15- Administrative Staff have gained enough courses in the area of using ZBB.	3.1000	.96791	20
16- The nature of any activities and their needs are defined by administrative staff.	3.3500	1.03999	20

The table. 6 identifies existing efficient staff to determined decision units and evaluating alternatives at the University of Nawruz. All variables (13 , 14 ,15) in this regard that the university has a good human resources and skilful staff in terms of identifying requirements of all departments and applying Zero-Based Budgeting accurately with Mean of (4.000 , 3.3500 , 3.100 , 3.3500) and SD of (0.99472 , 0.93330 , 0.96791 , 1.03999) respectively.

Table. 7 Efficient Accounting System Adopted by University

Variables	Mean	Std. Deviation	N
17-The present accounting system provide essential accounting data for preparation of ZBB.	3.4500	.98633	20
18- The present accounting system contributes to measure performance of all activities.	3.4500	.98633	20
19- It is easy to obtain details of cost centre according to the current accounting system.	3.3000	.92338	20
20- Controlling performance of university's department can be achieved by the current accounting system.	3.8000	.99777	20

The table. 7 illustrate the extent of existing efficient accounting system adopted by Nawruz University. It can be observed from the table above that the University of Nawruz currently has efficient accounting system through providing significant accounting data for ZBB purposes and identifying cost centres with Mean of (3.4500 , 3.300) and SD (0.98633 , 0.92338). Moreover, measuring and controlling performance of university activities and department can be done accurately by the accounting system used with Mean of (3.4500, 3.8000) and SD of (0.98633, 0.99777).

5. Conclusion and Recommendation

5.1 Conclusion

1- ZBB offers many advantages over other methods of budgeting such as accurate allocation of resources, regular evaluation of activities, improve communications within company and provide alternatives.

2- ZBB also includes limitations such as causing conflict between cost analysis and political considerations, difficulty to define decision units and restricted to only top management.

3- The empirical results showed that the concept ZBB and its applications is relatively a new experience to research participant.

4 - According to research analysis results, there is no need to apply ZBB, since the ability of current budget to distribute resources perfectly.

5- The research results indicated that the top management at the university encourages brining advanced technology and scientific tools such as ZBB.

6- Based on the results of current research, the university has an efficient accounting system and administrative staff to employ ZBB.

5.2 Recommendations

1- The University of Nawruz should realize the importance of ZBB method in order to take advantages of its benefits.

2- The researcher suggests that further study of using ZBB by private universities in Iraqi Kurdistan Region is necessary to find out the possibility of adopting it.

3- Zero-Based Budgeting should be examining on a larger sample of universities or to governmental institutions in Iraqi Kurdistan Government to find out the robustness results.

References:

1-Accounting Tools (2013) **What is incremental budgeting?** [Online] Available at: http://www.accountingtools.com/questions-and-answers/what-is-incremental-budgeting.html [Accessed 02-06-2014].

2- Allen, S. (1978). "*The Road from ZBB"*. John Wiley and Sons, New York, America.

3- Arnol ,J. & Turley,S.(1996) "*Accounting for Management Decisions"*. Prentice Hall Europe.

4- Burns, P. B. (2000), "*Introduction to Research Methods"*. 4th ed., London: SAGE Publications.

5- Burrows, G.H. & Syme, B. (2000) "Zero-based budgeting: origins and pioneers*". Abacus* , vol 36 (June),PP 226–41.

6- Certified Institution of Management Accountants (2008) Budgeting . [Online] Available at: http://www.cimaglobal.com/Documents/ImportedDocuments/cig_tg_budgeting_mar08.pdf [Accessed 04-06-2014].

7- China Accounting (2013) COMPARING BUDGETING TECHNIQUES [Online] Available at: http: //www.chinaacc.com/.../lixingcun13eeca8b50794e1fa2662d1261b92717 [Accessed 08-06-2014].

8- Collier P . M. (2003) "*Accounting For Managers . Aston Business School "*. Aston University, England : John Wiley & Sons Ltd .

9- Comptroller General (Elmer B. Staats) (1979). Streamlining Zero-Base Budgeting Will Benefit Decision Making Report to the Congress of the United States. Washington DC: United States General Accounting Office.

10- correia, C, Langfield-Smith, K, Thorne, H & Hilton, RW. 2008. *Management accounting: information for managing and creating value.* Southern African edition. Berkshire: McGraw-Hill.

11- Fong, C.C.S. & Kumar, N.K. (2002) " *Cost Accounting"*. Hong Kong: Association of Accounting Technicians.

12- Garrison, RH, Noreen, EW, & Brewer, PC. 2006. *Managerial accounting*. 11th edition. New York: McGraw-Hill/Irwin.

13- Gopal , R. (2009) " *Accounting for Manager*". 1st ed New Delhi*:* New Age International (P) Limited , Publishers .

14- Hilton, R.W.(2005) " *Managerial Accounting: Creating Value in a Dynamic Business Environment".* McGraw-Hill.

15- Horngren , C.T ., Foster , S.M ., Datar . T.B ., Gray , P. (1996) " *Cost Accounting in Australia : A Managerial Emphasis".* Prentice Hall .

16- Khandelwal, N.M. (2003) "*Top Management's Role in ZBB (Zero Base Budgeting)".* The Chartered Accountant, Ajmer, Rajasthan, India .

17- Marshall, G. & Jonker, L. (2010), "An introduction to descriptive statistics: A review and practical guide", *Radiography*, Vol. 16, No. 4, PP. 1-

18- NCSL (2010) What is Zero-base Budgeting? [Online] Available at: http://www.ncsl.org/default.aspx?tabid=12578; Irene Rubin, The Politics of Public Budgeting, 6th ed. (Washington, D.C.: CQ Press), 82-83 [Accessed 20-06-2014].

19- Pyhrr, P .A.(1973) "*Zero-base budgeting: a practical management tool for evaluating expenses*". New York: Wiley.

20- Warren, C.S., Reeve, J.M., and Fess, P.E. (2005), " *Accounting. 21st ed".* Thomson South-Western.

21- Saunders, M., Lewis, P. and Thornhill, A. (2007) " *Research methods for business students".* 4th ed. London: Prentice Hall.

22- Shelby , R. (2013) " *Zero-Base Budgeting for the 21st Century Public Administrator ".* Fiscal Research Center Andrew Young School of Policy Studies Georgia State University Atlanta, GA FRC Report No. 260 March.

23- Snell, Ronald (2009). "Zero-Base Budgeting and Legislative Use of Performance Information." Paper presented at the Republic Policy Committee Pennsylvania House of Representatives, Harrisburg, Pennsylvania.

24- Stonich, P. J., John, C., Kirby, J.R., Howard, P.& Weil, K. A (1977) " *Zero-Base Planning and Budgeting". 1st ed.* Homewood: Dow Jones-Irwin.Thompson & Eric E. Von Bauer.

25- The Institute of Chartered Accountants of India *(2013)* " *Advanced Management Accounting".* Board of Studies . India .

مدى امكانية تبني مدخل الموازنة الصفرية في الجامعات الخاصة - اقليم كردستان جامعة نوروز - دراسة الحالة

المستخلص

الموازنة الصفرية هي واحدة من الطرائق المستخدمة في إعداد الموازنات الحديثة وبصورة مبسطة فانه في ظل تطبيق هذه الموازنة يتم تحديد النفقات المتعلقة بكل نشاط من نقطة الصفر ولكل سنة على حدى وكأنه لا يوجد موازنة سابقة او ان النشاط المراد وضع موازنه له هو في بداية حياته الإنتاجية . ويهدف هذا البحث إلى معرفة تبني مدخل الموازنة الصفرية من قبل جامعات اقليم كردستان العراق . وقد شملت عينة الدراسة جامعة نوروز كإحدى الجامعات الاهلية في اقليم كوردستان في محافظة دهوك كحالة دراسية . وقد توصلت الدراسة إلى ان الجامعة تمتلك المقومات الأساسية لتطبيق الموازنة الصفرية وسبب ذلك ان لديها نظام محاسبي وكادر اداري كفوء قادر على تطبيق تلك الموازنة فضلا عن وجود دعم من الإدارة العليا في استخدام الأساليب العلمية والمتطورة مثل تطبيق الموازنة الصفرية في ترشيق النفقات ، على الرغم من ان الكادر الاداري ليس لديهم خلفية عامة على الموزانة الصفرية ومدى تطبيقها.

هە ڤسەنگیا چنەیی و رادا بەرهەڤیا پێدڤییێن سەرەکی ب پراکتیکرن لسەر زانکویا نە حکومی ل هەرێما کوردستانێ - زانکویا نەوروز وەك نمونە

کورتی:

هەڤسەنگیا چنەیی رێکەکە ژ رێکێن کارئینای ددانانا هەڤسەنگیێ دا، ئانکو خەرجییێن گرێدای بۆ هەمی چالاکیێ ژ خالا چنەیێ هەر سال دهێنە دەست نیشان کرن. وئەڤ ڤەکولینە ئارمانجێ دەت بۆ زانینا رادا بەرهەڤیا پێدڤییێن سەرەکی یێن پێویست بۆ پراکتیکرنا هەڤسەنگیا چنەیی لسەر زانکوییێن هەرێما کوردستانا عیراقێ دنمونا ڤەکولینا زانکویا نەوروز بخوڤە گرتیە وەگ ئێك ژ زانکوییێن نە حکومی ل هەرێما کوردستانێ ل پارێزگەها دهوکێ. وڤەکولین گەهشتیە وێ چەندێ کو بنەماییِن سەرەکی ل دەڤ زانکویا نەوروز هەنە بۆ پراکتیکرنا هەڤسەنگیا چنەیی ، چونکە زانکوییێ سیستەمێ ژمێریاری وکادرەکێ کارگێری یێ چالاك هەیە کو شیان لسەر پراکتیکرنا ڤێ هەڤسەنگیێ هەنە. وهەروەسا کارگێریا بەرز د زانکوییێ دا پالپشتیا کارئینانا ئامیرێن زانستی وپێشکەفتی دکەت وەکی پراکتیکرنا هەڤسەنگیا چنەیی دجێبەجێکرنا خەرجیا دا. سەرەرای وێ چەندێ کو کادرێن کارگێری چ زانیارییێن پشتەیی نینن لسەر هەڤسەنگیا چنەیی ورادا پراکتیکرنا وێ.

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The Comparison Differentiation of Neural Stem Cell in Mice and Rats (an In Vitro Study)

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Abstract

Background and aim**:** The study of differentiation of neural stem cells (NSCs)with different origin, due to their usability to treat nervous system disorders ,is of particular importance .In this in vitro study , differentiation of mice and rats NSCs were investigated.

Material and Methods : This study was experimentally done on NSCs isolated from the sub ventricular zone (SVZ) of C57 mice and brain cortex of rats' embryos .In order to assess the differentiation of neural stem cells into neurons, astrocytes and oligodendrocytes , by using immunocytochemical techniques .Neural stem cells were exposed to differentiation media for a three-day period .At the end of this time period, after fixation, samples were exposed with specific antibodies against neurons, astrocytes and oligodendrocytes .The number of differentiated cells was counted, the differentiation percent was determined and data was analyzed with Student's t-Tests.

Results : Results showed that the differentiation percent of rats cortical NSCs into neurons were significantly greater than mice SVZ NSCs .On the other hand ,the differentiation percent of mouse SVZ NSCs into astrocytes was significantly greater than rats cortical NSCs . The differentiation into oligodendrocytes was not change significantly between the two sources of NSCs mentioned above.

Conclusion: Percent of differentiation into neuron and astrocyte differs in mice and rats NSCs .So it seems that these differences would be considered in applyingthese cellsinanimal models.

Key Words: NSCs**,** differentiation**,** neurons, astrocytes and oligodendrocytes **.**

Introduction

Neural stem cells (NSCs) are one of therapeutic tool to treatcentral nervous system(CNS) disorders due to their high potential. These cells can proliferation in vitro, without losing their pluripotency (1, 2). Studies have shown that NSCs have critical role in embryonic nervous system development and in the adult, these cells with self-renewal ability can affected functions such as learning, memory, and response to injury (3).In recent years much more attention to neural stem cells as a therapeutic agent for neurodegenerative diseases has been directed. These cells can be differentiated to different types of cells in the CNS including; neurons, astrocytes and oligodendrocytes (4, 5). They also provide structural and chemical support for damaged tissues (6, 7).

Other studies show that human NSCs promote corticospinal axons regeneration and synapse reformation in injured spinal cord (8). These cells protect against glutamate-induced excitotoxicity and promote survival of injured motor neurons through the secretion of neurotrophic factors (9).

These cells have been used in various models of CNS neurodegenerative and traumatic disorders, including; spinal cord injury (10), cerebral ischemia (11), Parkinson (12), traumatic brain injury (13) and neuropathy (14).

But the problem here is that neural stem cells that have been isolated from various sources, do not have the same characteristics and this problem led to conflicting results in various models of CNS injudy that used NSCs with different origin. So characterization of neural stem cells with different origins and realize that each type of neural stem cells to be used for what purpose, is very important.

in this study the regard to the content expressed, that rate of NSCs differentiation derived from rat embryonic cortex and lateral ventricle wall of adult C57 mice to neurons and glial were compared.

Materials and Methods

Experimental study was performed on cells isolated from fetal rat cerebral cortex and lateral ventricle wall of C57 mice. These cells were previously isolated and stored in the laboratory.

Induction of differentiation of neural stem cells into neurons and glial cells

In order to induce the differentiation of neural stem cells into neurons and glial cells, they converting cellular mass into single cells by trypsin, and the cells on the coverslip treated with Poly-D-lysine and laminin (sigma) which were cultured for 72 h and exposed to differentiation medium (DMEM-F12 and B27 supplement and 1% FBS) without growth factors.

Immunocytochemical Evaluation:

NSCs after exposure to the differentiation mediumgradually branched into different cells were found in the CNS. Specific antibodies to neurons (Abcam, UK Beta tubulin III,), oligodendrocytes (OSP, Abcam, UK) and astrocytes (GFAP, Abcam, UK) were used to identify different types of neural cells.

After the elapse of time (72 h), the medium was removed and cellsexposed for 20 min with paraformaldehyde 4% then were washed two steps with PBS (Phosphate buffered saline) and then blocked with buffer containing Triton X-100 and BSA (Bovine Serum Albumin) for permeabilizingand covering non-specific site of cells respectively. Afterwards cells exposed to the following primary antibodies: anti-Beta tubulin III (1:500), Anti-GFAP (1:500) and anti-OPS (1:100) overnight at 4 ° C. The next day cells exposed to secondary antibodies conjugated with Texas Red in dark and humid environment for 1 hour.

Finally, after washing with PBS,Vecta Shield hard set of Dapi (To identify the nucleus of cells) was used to seal coverslips. To view images the Olympus model IX71 fluorescent microscope was used.

Statistical Analysis

Data were expressed as mean ± standard error of differentiated cells compared to total cells in three separate coverslip (ten microscopic fields were randomly selected from each cover slip). Independent Student's t-Tests were used for statistical analysis and P <0.05 was considered statistically significant.

Results:

Comparison of neuronal differentiation in rat and mouse neural stem cells

As can be seen in Figure 1, the percentage of neuronal differentiation in rat neural stem cells were significantly increased in comparison with mouse neural stem cells (P <0.001).

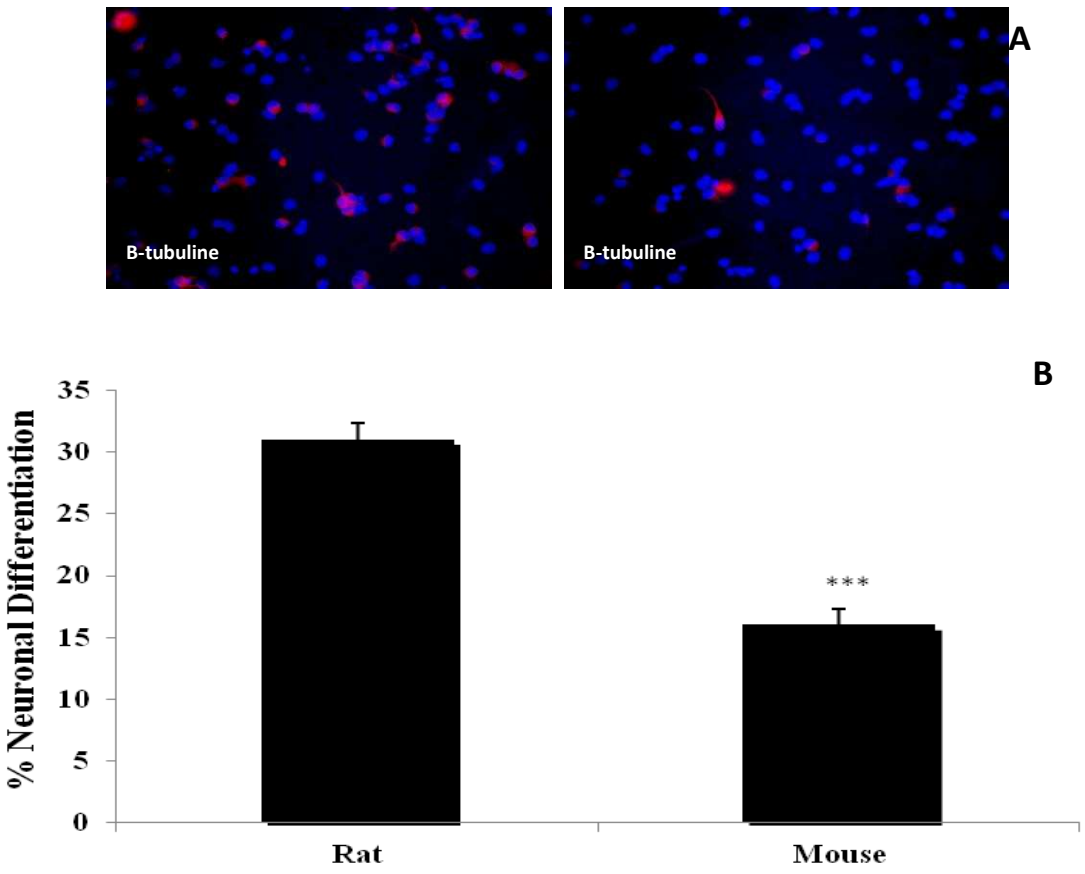

Figure1.

A: Images of rats (left) and mice (right) neural stem cells differentiate to neurons (expressing markers of B-tubuline). 400 times magnification.
B: Comparison of neural stem cells differentiation into neurons in rats and mice. Each column represents the mean ± SEM percentage of differentiated neurons in 30 microscopic fields. ***(P <0.001) indicate significant differences between the two groups.

Comparison of differentiation to astrocyte in rat and mouse neural stem cells

As can be seen in Figure 2, the percentage of astrocyte differentiation in mouse neural stem cells were significantly increased in comparison withrat neural stem cells (P <0.001).

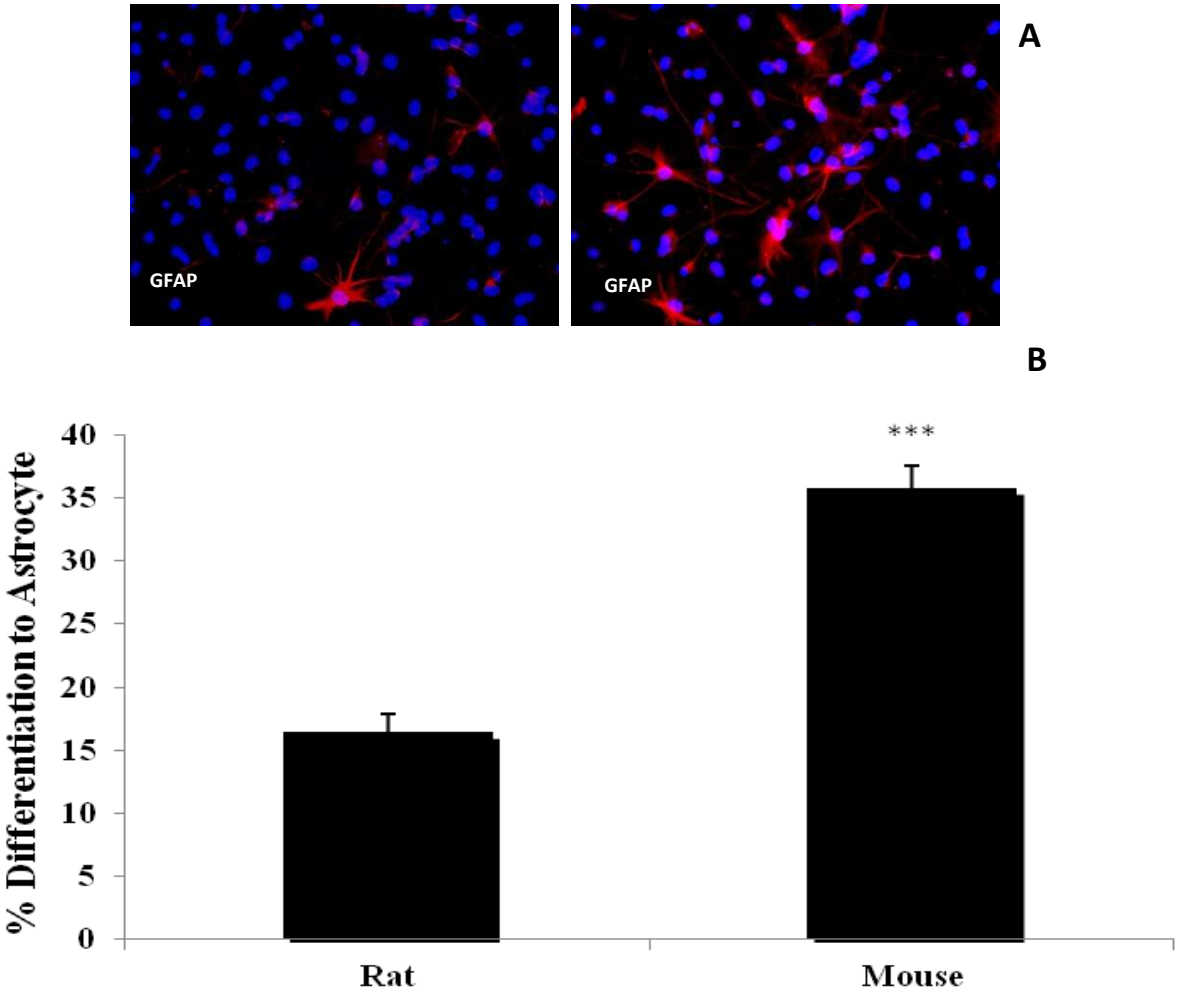

Figure2.

A: Images of rats (left) and mice (right) neural stem cells differentiate to astrocytes (expressing marker GFAP) 400 times magnification.

B: Comparison of neural stem cells differentiation into astrocytes in rats and mice. Each column represents the mean ± SEM percentage of differentiated astrocytes in 30 microscopic fields. *** (P <0.001) indicate significant differences between the two groups .GFAP : Glial fibrillary acidic protein.

Comparison of differentiation to oligodendrocytes in rat and mouse neural stem cells

As can be seen in Figure 3, the percentage of neural stem cells differentiate into oligodendrocytes in rats and mice showed no significant change.

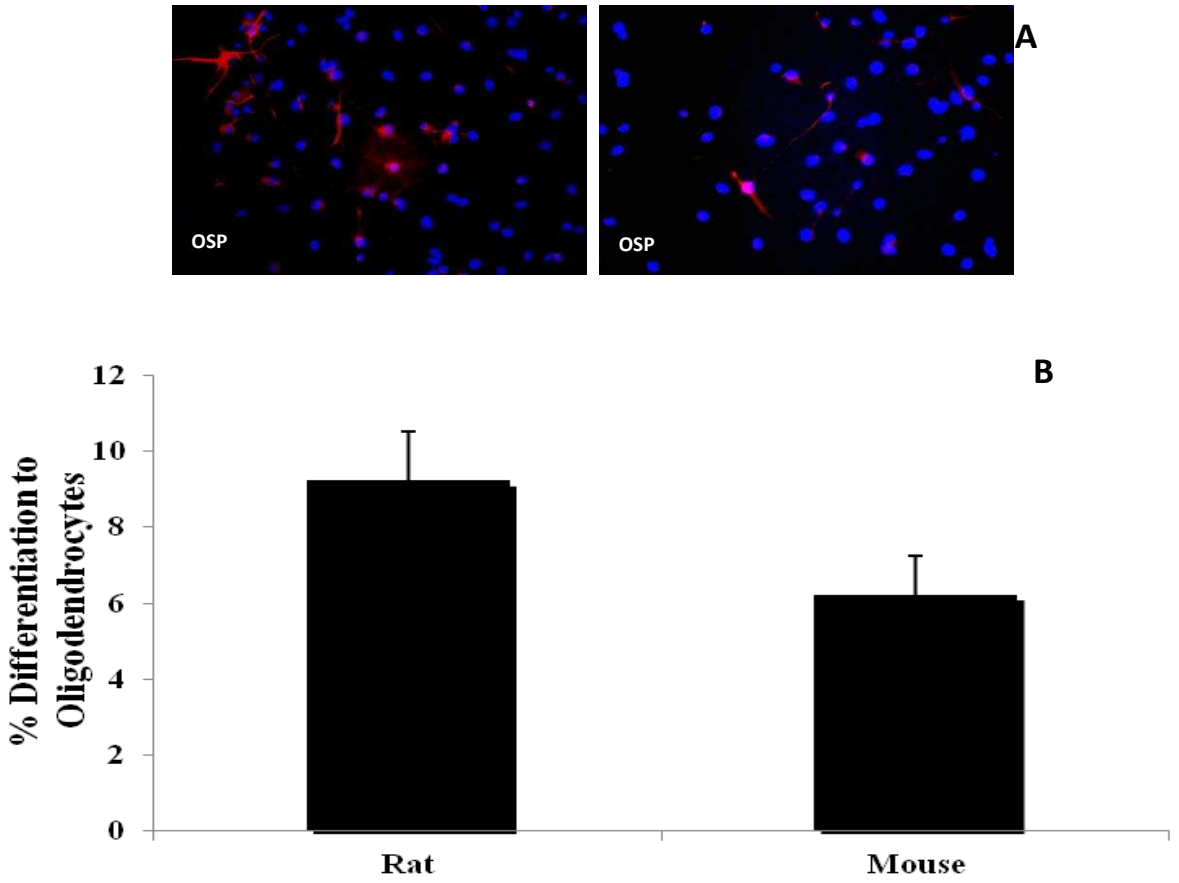

Figure 3.

A: Images of rats (left) and mice (right) neural stem cells differentiate to oligodendrocytes (expressing markers OSP) 400 times magnification.

B: Comparison of neural stem cells differentiate into oligodendrocytes in rats and mice. Each column represents the mean ± SEM percentage of differentiated oligodendrocytes

Discussion:

The results of this study showed that cortical rat NSCswere differentiated into neurons (31±1.34)astrocytes (16.4 ± 1.5) and oligodendrocytes (9.21 ± 1.31).On the other hand,NSCsisolatedfrom thesubventricular zone (SVZ) ofC57mice were differentiated into neurons (16±1.35) astrocytes (35.7 ± 1.8) and oligodendrocytes (6.22 ± 1.03).

The results (Statistical analyzes)revealed that neuronal differentiation of cortical rat NSCssignificantly increased($P < 0.001$)in comparison with mice NSCs and astrocytic differentiation significantly decreased compared to mice NSCs. Similar studies, confirmedour results about the differentiation of neural stem cells from rat embryos so that peng are also reported that 50% Rat embryonic hippocampal neural stem cells were differentiated into neurons (15).

This issue is important because in some CNS disorders, neuronal loss is a major problem that would be cured by replacing them with the appropriate cell type.

Alsowe found that mouse neural stem cells mostly differentiated into astrocytes that confermed by Azari et. al (16).

This in turn, can be important in two respects. First some of the CNS disorders needs chemical and structural support to create a scaffold for neurons as well as remove toxins from environment,therefore use of cells that differentiate into astrocytes are more preferred. Second, recognizing that the cells isolated from rat lateral ventricle walls are further differentiated to astrocytes, led to decrease of complications such asfibrosis or allodynia arising from transplantation of NSCs toneurodegenerative impairments that substantially dependent onoligodendrocyte or neuronal replacement.

Differentiation into unwanted cees after transplantation can cause many problems. As Macias and colleagues have reported that transplantation of mouse embryonic NSCs to spinal cord injury caused allodynia. They reported that the main cause of this complication was high differentiation of NSCs to astrocytes (17). Davies and colleagues also reported that all of astrocytes derived from embryonic precursors can not have the same value in restoration of spinal cord injury, but some of them can led to pain syndromes after transplantation. Therefore, they suggested these cells need to be checked Before transplatation to avoid allodynia (18).

On the other hand, Eaton and colleagues reported that neural stem cells differentiated into GABAergic neurons after transplantation in a model of neuropathic pain, decreased pain perception (19). Some studies have shown that neural stem cells after transplantation, are differentiatedjust to astrocytes (20), Others have reported that these cells were differentiated to astrocytes and oligodendrocytes (8 & 21) While other studies have shown that NSCs were differentiated into all three cell lines found in the CNS (22, 23) Which may be related to differences in cell origin.

Therefore, the study of neural stem cells differentiationwith different origins and effects of various factors on it, can beof great importance for the optimal use of these cells with minimal side effects

Conclusions:

The results of this study showed that the percentage of neural stem cells differentiate into neurons and astrocytes isolated from mice and rats are different.So these differencesshould be considered in the use of these cells in animal models.

Refferences:

1. Cao QL, Howard RM, Dennison JB, Whittemore SR. Differentiation of engrafted neuronal-restricted precursor cells is inhibited in the traumatically injured spinal cord. ExpNeurol 2002; 177 (2): 349-59.
2. Lee IS, Jung K, Kim M, Park KI. Neural stem cells: properties and therapeutic potentials for hypoxic-ischemic brain injury in newborn infants.Pediatr Int. 2010; 52 (6):855-65.
3. Tamm C, Duckworth J, Hermanson O, Ceccatelli S. High susceptibility of neural stem cells to methylmercury toxicity: effects on cell survival and neuronal differentiation.J Neurochem. 2006; 97(1): 69-78.
4. Okano H. Stem cell biology of the central nervous system. J. Neurosci. Res. 2002; 69:698–707.
5. Okano H. Neural stem cells and strategies for the regeneration of the central nervous system. ProcJpnAcadSer B PhysBiol Sci. 2010; 86(4): 438-450.
6. Gage, F.H., Mammalian neural stem cells. Science 2000; 287: 1433–1438.
7. Tian Y, Liu Y, Chen X, Zhang H, Shi Q, Zhang J, Yang P. Tetramethylpyrazine promotes proliferation and differentiation of neural stem cells from rat brain in hypoxic condition via mitogen-activated protein kinases pathway in vitro. NeurosciLett. 2010 Apr 19; 474(1):26-31. Epub 2010 Mar 3.
8. Peng L, Lian-hong J, Tao L, En-zhong L, Shi-guang Z. Human neural stem cells promote corticospinal axons regeneration and synapse reformation in injured spinal cord of rats. Chinese Med J 2006; 119 (16): 1331-8.
9. Llado J, Haenggeli C, Maragakis NJ, Synder EY, Rothstein JD. Neural stem cells protect against glutamate-induced excitotoxicity and promote survival of injured motor neurons through the secretion of neurotrophic factors. Mol Cell Neurosci 2004; 27: 322-31.
10. Izadpanah E, Fathi F, Hassanzadeh K, Asgari A,Assessment of Simultaneous Injection of Neural Stem Cells and Deprenyl to Improve Contusive Spinal Cord Injury in Rats. Yakhteh Medical Journal, 2010; 12 (3) : 411-420
11. Zhu JM, Zhao YY, Chen SD, Zhang WH, Lou L, Jin X. Functional recovery after transplantation of neural stem cells modified by brain-derived neurotrophic factor in rats with cerebral ischaemia. J Int Med Res. 2011; 39(2):488-98.
12. Zhu Q, Ma J, Yu L, Yuan C. Grafted neural stem cells migrate to substantianigra and improve behavior in Parkinsonian rats. NeurosciLett. 2009 Oct 25; 462 (3):213-8. Epub 2009 Jul 9.
13. Ma H, Yu B, Kong L, Zhang Y, Shi Y. Transplantation of neural stem cells enhances expression of synaptic protein and promotes functional recovery in a rat model of traumatic brain injury. Mol Med Report. 2011 Sep-Oct; 4(5):849 56.

14. Franchi S, Valsecchi AE, Borsani E, Procacci P, Ferrari D, Zaffa C, et al. Intravenous neural stem cells abolish nociceptive hypersensitivity and trigger nerve regeneration in experimental neuropathy.Pain. 2012 Apr; 153(4):850-61. Epub 2012 Feb 8.
15. Peng ZW, Xue YY, Wang HN, Wang HH, Xue F, Kuang F, Wang BR, Chen YC, Zhang LY, Tan QR. Sertraline promotes hippocampus-derived neural stem cells differentiating into neurons but not glia and attenuates LPS-induced cellular damage. ProgNeuropsychopharmacolBiol Psychiatry. 2012 Jan 10; 36(1):183-8. Epub 2011 Aug 25.
16. Azari H, Golmohammadi MG, Esfandiari E, Mardani M, Reynolds BA. Comparison of Neural Stem Cells Neurogenesis by Using Flow Cytometry versus Manual Counting Method. Journal of Isfahan Medical School Vol 25, No 86, Fall 2007.
17. Macias MY, Syring MB, Pizzi MA, Crowe MJ, Alexanian AR, Kurpad SN. Pain with no gain: allodynia following neural stem cell transplantation in spinal cord injury. Exp Neurol. 2006; 201(2):335-48. Epub 2006 Jul 12.
18. Davies JE, Pröschel C, Zhang N, Noble M, Mayer-Pröschel M, Davies SJ. Transplanted astrocytes derived from BMP- or CNTF-treated glial-restricted precursors have opposite effects on recovery and allodynia after spinal cord injury. J Biol. 2008; 7(7):1-20.
19. Eaton MJ, Plunkett JA, Martinez MA, Lopez T, Karmally S, Cejas P, Whittemore SR. Transplants of neuronal cells bioengineered to synthesize GABA alleviate chronic neuropathic pain. Cell Transplant. 1999 Jan-Feb; 8(1): 87-101.
20. Cao QL, Zhang YP, Howard RM, Walters WM, Tsoulfas P, Whittemore SR. Pluripotent stem cells engrafted into the normal or lesioned adult rat spinal cord are restricted to a glial lineage. Exp Neurol. 2001; Jan; 167(1): 48-58.
21. Vroemen M, Aigner L, Winkler J, &Weidner N. Adult neural progenitor cell grafts survive after acute spinal cord injury and integrate along axonal pathways. EurJ Neurosci . 2003; 18, 743-751.
22. Ogawa Y, Sawamoto K, Miyata T, Miyao S, Watanabe M, Nakamura M, Bregman BS, Koike M, Uchiyama Y, Toyama Y, Okano H. Transplantation of in vitro-expanded fetal neural progenitor cells results in neurogenesis and functional recovery after spinal cord contusion injury in adult rats. J Neurosci Res. 2002; Sep 15; 69(6):925-33.
23. Cummings BJ, Uchida N, Tamaki SJ, Salazar DL, Hooshmand M, Summers R, Gage FH, Anderson AJ. Human neural stem cells differentiate and promote locomotor recovery in spinal cord-injured mice. Proc. Natl. Acad. Sci. U S A. 2005 Sep 27; 102(39):14069-74. Epub 2005; Sep 19.

مقارنة تمايز خلايا الجذعية عصبية في الفئران والجرذان مختبراً(دراسة في الزجاج)

الخلاصة Abstract :

خلفية وهدف الدراسة Background and aim:

إنّ دراسة تمايز الخلايا الجذعية عصبية من أصول(أورومات) مختلفة تمنحنا القدرة على علاج العديد من الأمراض والاضطرابات العصبية، لذا يعتبر ذلك ذات أهمية جوهرية. في هذا البحث تمّ دراسة تمايز خلايا جذعية عصبية لدى الفئران والجرذان.

المواد والطرائق Material and Methods:

تمّت هذه الدراسة بشكل تجريبي على خلايا جذعية عصبية مأخوذة من منطقة تحت البطين (subventricular) لدى فئران C57 ومن قشرة الدماغ لدى أجنة الجرذان.وذلك لدراسة تمايز الخلايا الجذعية العصبية إلى خلايا عصبية(neurons)، وخلايا نجمية(astrocytes) وخلايا قليلة التغصّن(oligodendrocytes). حيث أستخدمت تقنية (immunocytochemical) في هذه الدراسة. بتعريض الخلايا الجذعية العصبية للتمايز بشكل واضح خلال ثلاثة أيام. وبعد وصول هذه الخلايا إلى مرحلة الثبات في نهاية هذه الفترة(3 أيام)، عُرضت هذه العينات إلى أضداد(antibodies) للخلايا العصبية(neurons) وللخلايا النجمية(astrocytes) وللخلايا قليلة التغصّن(oligodendrocytes). ومن ثم تمّ احصاء عدد الخلايا المتمايزة وحُددت نسبة التمايز وتمّ تحليل البيانات باستخدام اختبار t-Student.

النتائج Results:

أظهرت النتائج أنّ تمايز الخلايا الجذعية العصبية المأخوذة من قشرة الدماغ لدى الجرذان إلى خلايا عصبية كان أكبر بشكل واضح من تمايز الخلايا الجذعية العصبية المأخوذة من منطقة تحت البطينsubventricular لدى فئران C57. ومن ناحية أخرى كان تمايز الخلايا الجذعية العصبية لدى فئران C57 إلى خلايا نجمية(astrocytes)أكبر وبشكل واضح بالمقارنة مع الخلايا الجذعية العصبية المأخوذة من قشرة الدماغ لدى الجرذان. في حين لم يكن هناك فارق واضح بين نمطي الخلايا الجذعية لدى الفئران والجرذان في التمايز إلى خلايا قليلة التغصّن (oligodendrocytes).

الاستنتاج Conclusion:

تختلف نسبة تمايز الخلايا الجذعية العصبية إلى خلايا عصبية وخلايا نجمية لدى الفئران والجرذان. و أنه لا بد أن يؤخذ ذلك بعين الاعتبار لدى تطبيق هذه الخلايا لدى النماذج الحيوانية(animal model).

الكلمات المفتاحية Key Words:

NSCs، التمايز(differentiation)، الخلايا العصبية(neurons)، والخلايا النجمية(astrocytes)، والخلايا قليلة التغصّن (oligodendrocytes).

INDUCTION OF LIVER OXIDATIVE DAMAGE AND MONOCYTE CHEMOATTRACTANT PROTEIN-1 IN OPIUM ADDICTED MALE RATS

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ABSTRACT

Addiction with opium and its derivatives represent one of the major problems worldwide. The main objective of this study is to estimate the immunomodulatory chemokine , liver oxidative enzyme markers and apoptosis in opium addicted rats via intraperitoneal injection. Thirty male rats were randomly distributed into three groups. Group 1 regarded as control, while in group2 and 3, the animals were daily injected intraperitoneally with (25 and 50 mg opium/kg b.w.) for seven successive days. The level of Monocyte Chemoattractant Protein-1 (MCP-1) chemokine was estimated within sera samples using ELISA special kit. Enzymatic levels of alkaline phosphatase (ALP), Xanthine Oxidase (XO), Glucose-6-phosphate dehydrogenase (G6PDH) and lactate dehydrogenase (LDH) in serum were assayed, and concentration of Malondialdehyde (MDA) estimated, besides determining the percent count of apoptotic hepatocytes. Significant induction was observed in MCP-1 level. The activity of ALP and XO were significantly and dose dependently changed, whereas the MDA significantly elevated in both doses, but there were no difference between the two doses. A significant reduction was occurred in G6PD in both low and high doses. The frequency of apoptotic hepatocytes significantly increase in concentration dependent manner. This study suggests that intraperitoneal injection of opium causes immunomodulation through induction of MCP-1 and also causes alteration in liver oxidant and antioxidant balance. Hepatocyte apoptosis occurred in concentration dependent manner.

Keywords: Opium, MCP-1, Oxidative stress, Apoptosis, Rats

INTRODUCTION

Opium abuse considered as a major problem for every society including our country. The United Nations International Drug Control Program conservatively estimates that Use of opiates (heroin and opium) is around 16.5 million people, or 0.4 per cent of the population aged (15-64), although a high prevalence for opiate use has been reported from South-West and Central Asia, Eastern and South-Eastern Europe and North America[1]. Most of the researches have been focused on heroine in drugs addiction investigations because of its spreading in western countries, but in our region, opium is mostly used because it is very common in Iran which considered as the main source of narcotic drugs for our country.

Opium is a narcotic analgesic drug which is originally obtained from the unripe seed pods of opium poppy. Opium is used as the raw material for the synthesis of some drugs such as morphine, noscapine, papaverine and codeine which constitute 8-17%, 1-10%, 0.5-1.5% and 0.7-5% of opium, respectively [2].

Several researches have been performed on the actions of opium against the level of biochemical hormonal parameters[3]. Previous data revealed that opioid receptors, which are expressed by some immune cells, are similar to neuronal type opioid receptors, especially k and δ-opioid type receptors. Researchers revealed the presence of novel specific opioid receptors for morphine on lymphocytes. It is suggested that opioid receptor axis behaves in an autocrine or paracrine manner[4]. Inhibition of various leukocyte biological functions such as phagocytosis, cytokine production, chemotactic response, and generation of reactive oxygen species and arachidonic acid derivatives have all been recorded following the treatment with most of opiates[5]. Morphine can directly depress the function of macrophages and polymorphonuclear leukocytes (PMNs), and regulate expression of one type of T-cell surface marker[6].

Recently, studies focused on measuring of cytokines and chemokines in opiates treated patients. [7]reported significant increases of MCP-1 in morphine treated patients. While no change of eotaxin, colony stimulating factor, granulocyte (G-CSF), colony stimulating factor granulocyte-macrophage (GM-CSF), IFN-γ, interleukins, monocyte chemotactic protein 1 (MCP-1), , tumor necrosis factor-α (TNF-α) and TNF-β were detected in a prospective study performed on cancer patients[8].

In spite of little literatures about the impact of opium on the level of oxidative stress markers and apoptotic activity, [9] indicated that opium probably plays an important role in brain and liver cells apoptosis, therefore, leading neurotoxicity and hepatotoxicity. Also, Morphine has been demonstrated to exert oxidative stress in various cells [10]. The state of an enzymatic component of the antioxidant system, intensity of lipid peroxidation (LPO) in the liver, nitric oxide level in blood plasma were altered in rats subjected to chronic morphine intoxication [11].

The cytotoxicity and apoptotic effects of opium chemical constitutes have been well studied such as morphine [9, 10] noscapine [11] and codeine [12]. The underlying mechanism by which morphine induced apoptosis thought to be through stimulating the expression of both Fas and Fas ligand (FasL), and inducing macrophage apoptosis [9]. Fas (CD95)-induced apoptosis in liver cells and cytotoxic activities of infiltrating neutrophils in the exposed liver are two major events that lead to hepatitis [13].

Little is known about the actions of opium on the balance of redox reactions and level of MCP-1 chemokine in experimental animals. Therefore, our investigation is designed to evaluate the effects of different concentrations of opium on the activity of some enzymes that are related to oxidation- antioxidant processes besides to the level of MCP-1 in male rats.

METHODS

Animals

Adult male rats *Rattus norvegicus* were bred in animal house of Biology Dept. /College of Science/University of Salahaddin. In the present study 30 rats weight about (200-250) gram were used.

Drug Preparation

The extract of Opium was obtained from the directorate of narcotics control in Erbil province-Iraq. The stock solution of Opium was prepared by dissolving 2.5gms of opium extract in 50ml of 35% diluted ethanol creating a concentration of (50mg/ml). Amount of 1ml of the prepared solutions were injected intraperitoneally to each 1kg of rat body weight (50mg/kg). While, further dilution was made for preparation of 25mg/kg rat b.w..

Experimental Design

The rats of each experiment were divided into three groups:

Control group (6 rats): The rats of this group were fed with normal standard rat diet without any treatments.

Opium 1st group (6 rats) : The rats of this group were treated with intraperitoneal injection of 25mg/kg/day opium for a week.

Opium 2nd group (6 rats) : The rats of this group were treated with intraperitoneal injection of 50mg/kg/day opium for a week [14]. Then the rats of all groups were anesthetized, the blood samples were withdrawn from direct heart puncture and the rats then dissected for other estimations and tests.

Monocyte Chemoattractant Protein-1 Measurement by ELISA

MCP-1 concentrations in the serum samples were measured by antibody enzyme-linked immunosorbent assay (ELISA) with using of commercial kit (ELISA Rat MCP-1, Promkine, Heidelberg-Germany) as described previously]. Blood samples were collected in serum-separated tubes. All reagents, samples, and working standards were brought to room temperature and prepared according to the manufacturer's directions. Reactions were quantified by optical density using an automated ELISA reader (Lab. Tech. USA) at 450 nm wavelength.

Serum enzymatic analysis

Blood samples were taken into glass tubes with rubber caps, labeled and centrifuged at 4000 g for 10 min. Serum enzymes [Alkaline phosphatase (ALP), Xanthine Oxidase (XO), Glucose-6-phosphate dehydrogenase (G6PDH) and lactate dehydrogenase (LDH)] were assayed using colorimetric specific kits for each enzyme.

Determination of serum malondialdehyde:

The assessment of the lipid peroxidation process was done by determination of the end product, malondialdehyde[12]. The level of serum MDA was determined spectrophotometrically, in brief , 150 µl of serum sample was mixed with 1ml trichloroacetic acid (TCA) 17.5% and 1ml of 0.66% thiobarbituric acid (TBA), then vortexed, incubated in boiling water for 15 minutes, then allowed to cool. After that one ml of 70% TCA was added. The mixture was allowed to sit at room temperature for 20

minutes. Then the sample centrifuged at 2000 rpm for 15 minutes, and the supernatant absorbance was recorded by spectrophotometer at 532nm wavelength.

Histological examination for detecting apoptosis frequency

After removing of the liver, small portions were immediately fixed in 10% formalin and embedded in paraffin ; 5mm thick sections were stained with hematoxylin and eosin[15]. Apoptotic cells were counted. The frequencies were determined by counting 1000 hepatocytes per liver, and the average of percent values were applied. Only apoptotic bodies containing nuclear fragments were considered[16].

Statistical analysis:

Data were expressed as means± standard error (M±SE) and statistical analysis was perfprmed using statistically available software (SPSS 17 for Windows 7). Data analysis was made using one-way analysis of variable (ANOVA). The comparison between groups were done using Duncan's post hoc test. The differences were considered significant and high significant when P values were <0.05 and <0.01 respectively.

RESULTS:

Effect of Opium on Monocyte Chemoattractant Protein-1

Opium received rats showed significant induction in the level of serum MCP-1 (P<0.05). The influence of concentrations was not significantly reported when we doubled the amount of injected dose from 25mg/kg to 50mg/kg. The mean± SE values were (17.066±1001 and 19.527±1974) respectively, while the value of MCP-1 level in control rats was (12.389±989) as illustrated in figure (1).

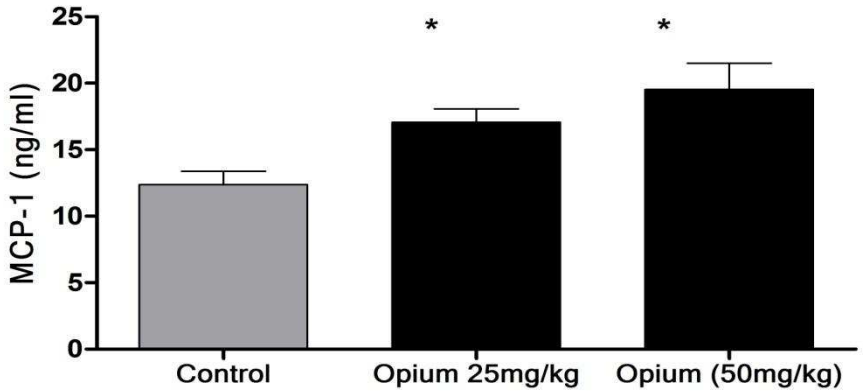

Figure (1): Enhancement of serum MCP-1 level by using two doses of opium. (*) indicates the significant differences at level (P<0.05) between opium treated rats and control group. Two doses of opium (25 and 50 mg\kg) were injected intraperitoneally for seven successive days. The data were presented as Mean and S.E.

Effect of Opium on Malondialdehyde and the serum enzymes activity:

The demonstrated results reported that opium addiction significantly increased the activity of serum xanthine oxidase (P<0.01). The induction of XO activity by opium was concentration dependent. The levels of XO were (2.4±0.187) and (4.0±0.22) in rats treated with 25mg and 50mg opium respectively as illustrated n figure (2).

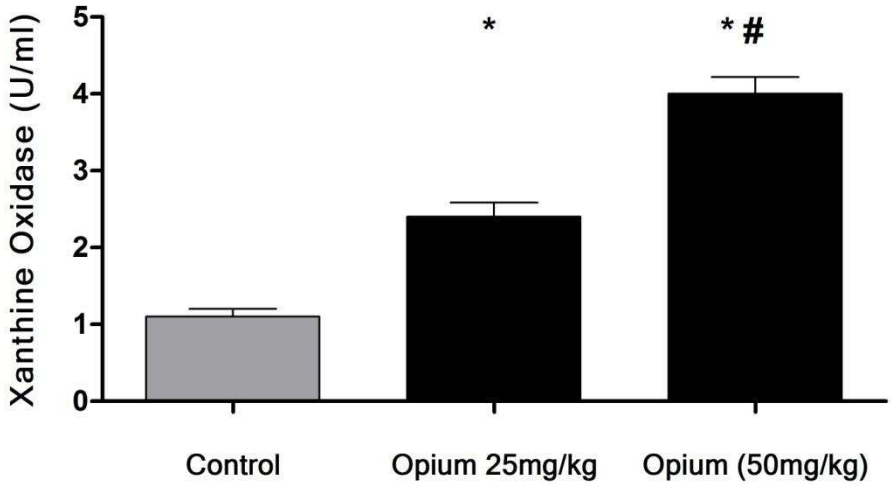

Figure (2): Elevation of serum XO activity in a concentration dependent manner by using two doses of opium. (*) indicates the significant differences at level (P<0.05) between opium treated rats and control group. (#) indicates the significant differences at level (P<0.05) between the two doses. Two doses of opium (25 and 50 mg\kg) were injected intraperitoneally for seven successive days. The data were presented as Mean and S.E.

Induction of Malondialdehyde, lipid peroxidation marker, (P<0.05) was one of the obvious observations in sera of rats treated with 25mg/kg and 50mg opium with means (3.22±0.14 and 3.52±0.11) as compared with control rats (2.58±0.21) (Figure 3).

The action of opium addiction on the activity of serum ALP, G6PDH and LDH are also presented which they are almost considered as the markers of liver damage. The dose dependent impact of opium was clearly observed in serum ALP levels, as there were significant inductions according to the doses of opium treatments (25mg/kg and 50mg) with mean values (15.00± 0.83 and22.34± 3.49) respectively comparing with control value (7.79± 0.86) as illustrated in figure (4).

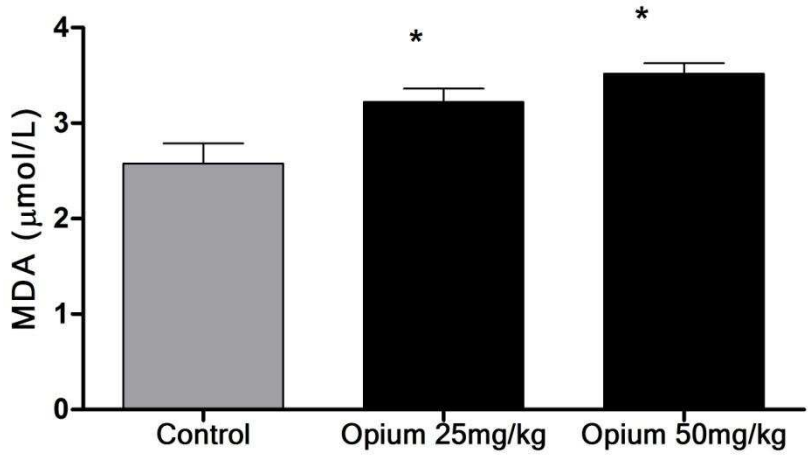

Figure (3): Elevation of serum MDA level by using two doses of opium. (*) indicates the significant differences at level (P<0.05) between opium treated rats and control group. Two doses of opium (25 and 50 mg\kg) were injected intraperitoneally for seven successive days. The data were presented as Mean and S.E.

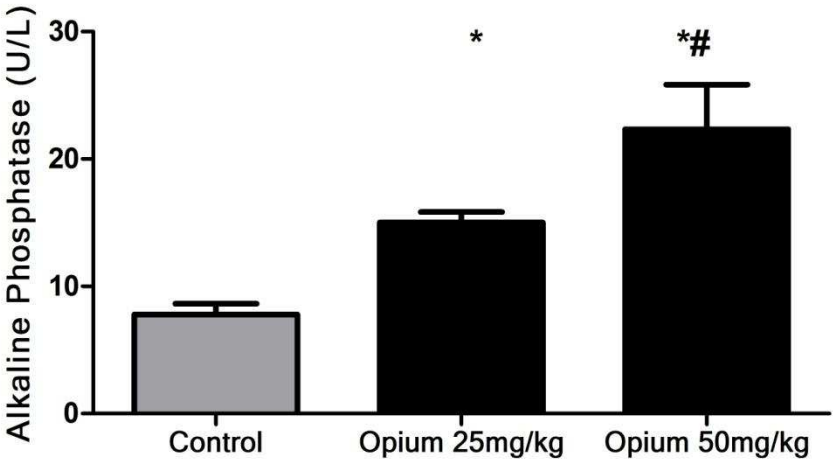

Figure (4): Elevation of serum ALP activity in a concentration dependent manner by using two doses of opium. (*) indicates the significant differences at level (P<0.05) between opium treated rats and control group. (#) indicates the significant differences at level (P<0.05) between the two doses. Two doses of opium (25 and 50 mg\kg) were injected intraperitoneally for seven successive days. The data were presented as Mean and S.E.

The activity of G6PD was significantly decreased in both concentrations without the action of as there is no significant change in the level of G6PD between the two doses. The mean values were (0.459± 0.026) and (0.336± 0.037) in rats treated with 25mg/kg and 50mg opium respectively as compared to the control value (1.738± 0.190) as shown in figure (5). While significant induction of LDH activity were reported in both 25mg/kg and 50mg opium treatments with means (679.3±123.3) and (452.6±69.6) respectively as compared to control value which was (338.6±51.8) as clarified in figure(6),but more potent influence of the first dose rather than the other was unexpected .

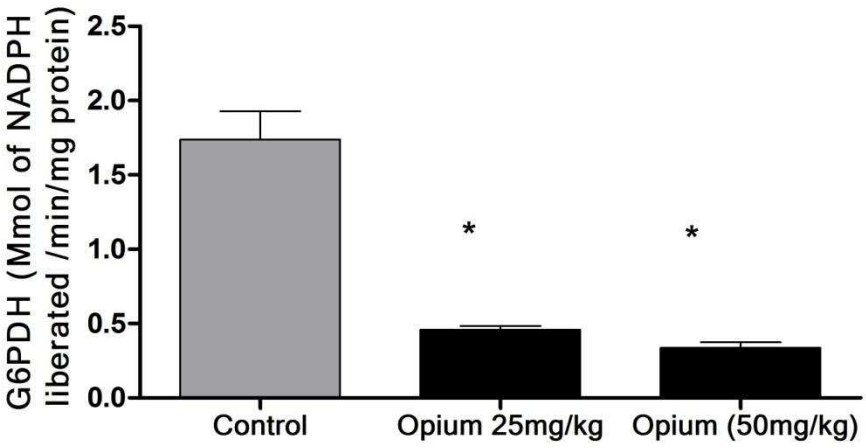

Figure (5): Reduction of serum G6PD activity by using two doses of opium. (*) indicates the significant differences at level (P<0.05) between opium treated rats and control group. Two doses of opium (25 and 50 mg\kg) were injected intraperitoneally for seven successive days. The data were presented as Mean and S.E.

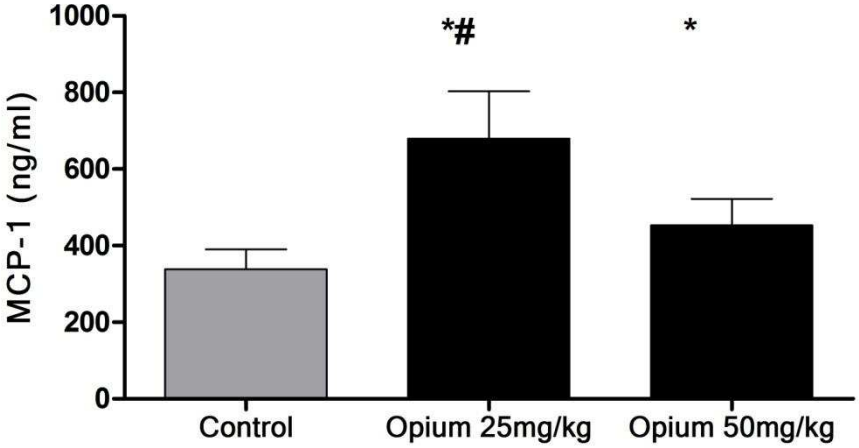

Figure (6): Elevation of serum LDH activity by using two doses of opium. (*) indicates the significant differences at level (P<0.05) between opium treated rats and control group. (#) indicates the significant differences at level (P<0.05) between the two doses. Two doses of opium (25 and 50 mg\kg) were injected intraperitoneally for seven successive days. The data were presented as Mean and S.E.

Apoptotic cell count

The counting of apoptotic cells in both doses opium treated rats were significantly higher than in the control group ($p < 0.05$) , the frequency of apoptosis was significantly and dose dependently increased in 50mg\kg opium treatment as compared to 25mg\kg opium treated rats (figure 7). The mean percent apoptotic hepatocytes in low dose of opium was (4.6±0.19), while it was (5.9±0.26) in high dose as compared to control group (1.8±0.11).

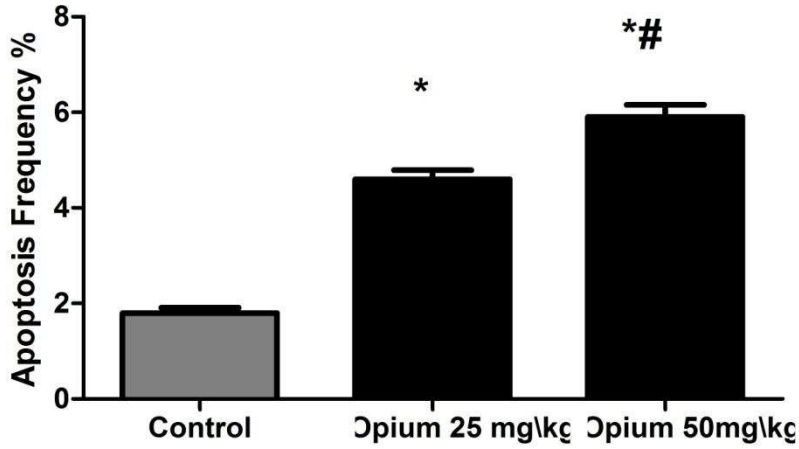

Figure (7): Dose dependent apoptotic influence of opium (25 and 50 mg|kg) on hepatocytes. (*) indicates the significant differences at level (P<0.05) between opium treated rats and control group. (#) indicates the significant differences at level (P<0.05) between the two doses. Two doses of opium were injected intraperitoneally for seven successive days. The frequency of apoptosis was measured by finding the percent of apoptotic bodies. The data were presented as Mean percent of apoptotic cells and S.E. of the mean.

DISCUSSION

The destructive and toxic actions of opium are mainly due to its high content of morphine and other alkaloids such as codeine, noscapine , papaverine and thebaine, rather than other alkaloids which are found in lesser quantities [2]. The inducible function of opium on MCP-1 (CCL2) and its receptor CCR2 production is suggested to be through μ-opoid receptor mechanism [13]. It has been reported that μ-opoid receptor is responsible for inhibition of several immune processes such as NK cell activity [17], mitogen response [18] ,monocyte-macrophage function [19] and antibody production [20]. Though, the immunomodulatory impact of opium may be through alteration of cytokine release [8] and also inhibiting the mRNA expression of immune induced chemokines [21].

It has also suggested that the alteration in the cytokine profile could be through induction of TGF-β production, which is considered to be one of the common immunosuppressive factors that inhibits the release of INF-γ, IL-2 and IL-3 synthesis and also it induces the production of MCP-1[22]. However, the inhibitory action of morphine on MCP-1 has been found out in LPS induced acute inflammation *in vitro* [23].

Long term daily use of opium is reported to be associated with up-regulation of IL-10 which acts as immunoregulatory factor [24]. The release of MCP-1 induction in our results also supports the immunomodulatory function of opium in previous findings. MCP-1 has a great impact on inhibition of INF- γ and IL-2 through alteration in the balance of Th1 and Th2 by increasing the differentiation to Th2 instead of Th1, hence it increases the production of LI-4 and IL-10 and modulate the immune response [25].

In our finding, the relation between inflammatory markers, oxidative stress and proinflammatory chemokine have been established. The alteration in Oxidant\Antioxidant balance has been associated clearly with the action of opium [26]. It has been also postulated that chronic morphine intoxication could causes pathological changes in the liver [27], therefore we revealed significant elevation of MDA which indicates high lipid peroxidation and the change of ALP, LDH and G6PD which also illustrate serious liver oxidative damage. Studies found that most of biomolecules sensitive for hepatitis usually alter by the action of morphine like LDH, MDA, aminotransferases and phosphatases enzymes[28].

Destructive and metabolic change in liver is usually accompanied with hyperenzymenia were recorded in patients with first grade opium users, but the obvious increase was in aminotransferase level [29]. Also opium smoker present a low to moderate inflammation which is defined by an increase in the inflammatory markers [30].

Beside morphine, opium poppy contains other alkaloids which affect the liver function and antioxidant status of the body, such as crytopine which is one of the alkaloids appeared to increase lipid peroxidation and disturb cellular defense system beside producing cytotoxicity [31]. Thebaine, another alkaloid in opium showed to have hepatotoxicity impact, however the action is poorly documented [32].

Morphine administration may enhance the catabolism and inhibit the anabolism of purine nucleotides through significantly increasing of the mRNA level of Adenosine deaminase (ADA) and XO in brain tissues in heroin treated experimental animals [33]. The proposed mechanism for rising of XO is suggested to be related to a stable increasing of μ-opoid receptor expression during opium addiction, which causes XO mRNA expression[34].

Hepatocyte apoptotic activity is another marker for hepatotoxic action of opium in the liver. The chronic opium treatment has been showed to play important roles in the cascade events of apoptosis in neuronal [35] and hepatic cells [36].

Opium and Its chemical constitutes like morphine [37] noscapine[38], codeine [39] and papaverine [40] have been shown to inhibit cell growth and trigger apoptosis, but various underlying molecular mechanisms are proposed. morphine demonstrated to induces Jurkat cell apoptosis through FADD/p53, anti-apoptotic PI3K/Akt and NF-kappaB pathways [41]. It has been also concluded that the blocking of opioid receptor has ability to improve the resistance of mice to Fas-induced hepatitis via a peripheral mechanism that does not play role in down-modulation of Fas mRNA in hepatocytes and also doesn't decrease proinflammatory activity of neutrophils. However, Fas (CD95)-induced hepatocyte apoptosis is the major event leading to hepatitis [42]. Supporting to our results, an in vivo study on mice proposed that repeated morphine administration even at lower doses would induce oxidative stress in the liver, which may contribute to induction of apoptosis in hepatocytes[36].

CONCLUSION

The association between oxidative markers, Liver function, cytotoxicity and certain proinflammatory chemokine with repeated opium administration in rats has been demonstrated in this study. Opium found to have immunomodulatory action through induction of MCP-1 production and also it causes alteration in liver oxidant and antioxidant balance. Hepatocytes apoptosis which occurred in concentration dependent manner could be the outcome of hepatitis.

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REFERENCES

1- Report WD: **United Nations Office on Drugs and Crime (UNODC)**. In*.* http://www.unodc.org/wdr/en/opiates.html; 2007.

2- Paul L, Sciff J: **Opium and Its Alkaloids**. *American Journal of Pharmaceutical Education* 2002, **66**:186-194.

3- Karam GA, Reisi M, Kaseb AA, Khaksari M, Mohammadi A, Mahmoodi M: **Effects of opium addiction on some serum factors in addicts with non-insulin-dependent diabetes mellitus**. *Addict Biol* 2004, **9**(1):53-58.

4- Bidlack JM: **Detection and function of opioid receptors on cells from the immune system**. *Clin Diagn Lab Immunol* 2000, **7**(5):719-723.

5- Eisenstein TK, Hilburger ME: **Opioid modulation of immune responses: effects on phagocyte and lymphoid cell populations**. *J Neuroimmunol* 1998, **83**(1-2):36-44.

6- Suzuki S, Chuang LF, Doi RH, Chuang RY: **Morphine suppresses lymphocyte apoptosis by blocking p53-mediated death signaling**. *Biochem Biophys Res Commun* 2003, **308**(4):802-808.

7- Chloropoulou P, Iatrou C, Vogiatzaki T, Kotsianidis I, Trypsianis G, Tsigalou C, Paschalidou E, Kazakos K, Touloupidis S, Simopoulos K: **Epidural anesthesia followed by epidural analgesia produces less inflammatory response than spinal anesthesia followed by intravenous morphine analgesia in patients with total knee arthroplasty**. *Med Sci Monit* 2013, **19**:73-80.

8- Makimura C, Arao T, Matsuoka H, Takeda M, Kiyota H, Tsurutani J, Fujita Y, Matsumoto K, Kimura H, Otsuka M *et al*: **Prospective study evaluating the plasma concentrations of twenty-six cytokines and response to morphine treatment in cancer patients**. *Anticancer Res* 2011, **31**(12):4561-4568.

9- Asiabanha M, Asadikaram G, Rahnema A, Mahmoodi M, Hasanshahi G, Hashemi M, Khaksari M: **Chronic Opium Treatment Can Differentially Induce Brain and Liver Cells Apoptosis in Diabetic and Non-diabetic Male and Female Rats**. *Korean J Physiol Pharmacol* 2011, **15**(6):327-332.

10- Singhal PC, Pamarthi M, Shah R, Chandra D, Gibbons N: **Morphine stimulates superoxide formation by glomerular mesangial cells**. *Inflammation* 1994, **18**(3):293-299.

11- Miskevich DA, Petushok NE, Lelevich VV, Lelevich SV, Borodinskii AN: **[Effect of chronic morphine treatment on free radical state]**. *Biomed Khim* 2007, **53**(2):190-195.

12- Muslih RD, Al-Nimer OM, Al-Zamely MA: **The level of Malondialdehyde after activation with (H2O2 and CuSO4) and inhibited by Desferoxamine and Molsidomine in the serum of patients with acute myocardial infection.** *Nat J Chem* 2002, **5**:148-149.

13- Rock RB, Hu S, Sheng WS, Peterson PK: **Morphine stimulates CCL2 production by human neurons**. *J Neuroinflammation* 2006, **3**:32.

14- Karam GA, Rashidinejad HR, Aghaee MM, Ahmadi J, Rahmani MR, Mahmoodi M, Azin H, Mirzaee MR, Khaksari M: **Opium can differently alter blood glucose, sodium and potassium in male and female rats**. *Pak J Pharm Sci* 2008, **21**(2):180-184.

15- Bancroft JD, Steven A, Dawson I: **Theory and Practice of Histological Techniques.** Edinburgh, London, New York: Churchill-Livinstone; 1977.

16- Acar T, Ceyhan K, Çolakoglu T: **Inhibition of Apoptosis Prevents Liver Failure and Improves Survival Rates after Extensive Hepatectomy in Rats.** . *Acta chir belg* 2006, **106**:696-700.

17- Saurer TB, Carrigan KA, Ijames SG, Lysle DT: **Suppression of natural killer cell activity by morphine is mediated by the nucleus accumbens shell**. *J Neuroimmunol* 2006, **173**(1-2):3-11.

18- Vassou D, Bakogeorgou E, Kampa M, Dimitriou H, Hatzoglou A, Castanas E: **Opioids modulate constitutive B-lymphocyte secretion**. *Int Immunopharmacol* 2008, **8**(5):634-644.

19- Hatsukari I, Hitosugi N, Dinda A, Singhal PC: **Morphine modulates monocyte-macrophage conversion phase**. *Cell Immunol* 2006, **239**(1):41-48.

20- Morgan EL: **Regulation of human B lymphocyte activation by opioid peptide hormones. Inhibition of IgG production by opioid receptor class (mu-, kappa-, and delta-) selective agonists**. *J Neuroimmunol* 1996, **65**(1):21-30.

21- Campbell LA, Avdoshina V, Rozzi S, Mocchetti I: **CCL5 and cytokine expression in the rat brain: differential modulation by chronic morphine and morphine withdrawal**. *Brain Behav Immun* 2013, **34**:130-140.

22- Chao CC, Hu S, Molitor TW, Zhou Y, Murtaugh MP, Tsang M, Peterson PK: **Morphine potentiates transforming growth factor-beta release from human peripheral blood mononuclear cell cultures**. *J Pharmacol Exp Ther* 1992, **262**(1):19-24.

23- Martin JL, Koodie L, Krishnan AG, Charboneau R, Barke RA, Roy S: **Chronic morphine administration delays wound healing by inhibiting immune cell recruitment to the wound site**. *Am J Pathol* 2010, **176**(2):786-799.

24- Ghazavi A, Solhi H, Moazzeni SM, Rafiei M, Mosayebi G: **Cytokine profiles in long-term smokers of opium (Taryak)**. *J Addict Med* 2013, **7**(3):200-203.

25- Azarang A, Mahmoodi M, Rajabalian S, Shekari MA, Nosratabadi J, Rezaei N: **T-helper 1 and 2 serum cytokine assay in chronic opioid addicts**. *Eur Cytokine Netw* 2007, **18**(4):210-214.

26- AKSOY L: **Oxidant / antioxidant equilibrium in rats supplemented with diesel fuel or with opium poppy (Papaver somniferum L.) seed oil biodiesel**. *Revue Méd Vét,* 2013, **164**(1):34-38.

27- Bekheet SH: **Morphine sulphate induced histopathological and histochemical changes in the rat liver**. *Tissue Cell* 2010, **42**(4):266-272.

28- Atici S, Cinel I, Cinel L, Doruk N, Eskandari G, Oral U: **Liver and kidney toxicity in chronic use of opioids: an experimental long term treatment model**. *J Biosci* 2005, **30**(2):245-252.

29- Kharchenko NK, Synyts'kyi VN, Kovtun TV: **[Comparative analysis of the effects of alcoholism and opium addiction on liver function]**. *Fiziol Zh* 2001, **47**(2):81-86.

30- Ghazavi A, Mosayebi G, Solhi H, Rafiei M, Moazzeni SM: **Serum markers of inflammation and oxidative stress in chronic opium (Taryak) smokers**. *Immunol Lett* 2013, **153**(1-2):22-26.

31- Aneja R, Katyal A, Chandra R: **Stimulation of lipid peroxidation and impairment of glutathione-dependent defense system in Wistar rats treated with cryptopine, a rare non-narcotic opium alkaloid**. *Eur J Drug Metab Pharmacokinet* 2004, **29**(1):31-36.

32- Herve S, Riachi G, Noblet C, Guillement N, Tanasescu S, Goria O, Thuillez C, Tranvouez JL, Ducrotte P, Lerebours E: **Acute hepatitis due to buprenorphine administration**. *Eur J Gastroenterol Hepatol* 2004, **16**(10):1033-1037.

33- Li K, He HT, Li HM, Liu JK, Fu HY, Hong M: **Heroin affects purine nucleotides metabolism in rat brain**. *Neurochem Int* 2011, **59**(8):1104-1108.

34- Liu C, Liu JK, Kan MJ, Gao L, Fu HY, Zhou H, Hong M: **Morphine enhances purine nucleotide catabolism in vivo and in vitro**. *Acta Pharmacol Sin* 2007, **28**(8):1105-1115.

35- Liu LW, Lu J, Wang XH, Fu SK, Li Q, Lin FQ: **Neuronal apoptosis in morphine addiction and its molecular mechanism**. *Int J Clin Exp Med* 2013, **6**(7):540-545.

36- Payabvash S, Beheshtian A, Salmasi AH, Kiumehr S, Ghahremani MH, Tavangar SM, Sabzevari O, Dehpour AR: **Chronic morphine treatment induces oxidant and apoptotic damage in the mice liver**. *Life Sci* 2006, **79**(10):972-980.

37- Emeterio EP, Tramullas M, Hurle MA: **Modulation of apoptosis in the mouse brain after morphine treatments and morphine withdrawal**. *J Neurosci Res* 2006, **83**(7):1352-1361.

38- Ye K, Ke Y, Keshava N, Shanks J, Kapp JA, Tekmal RR, Petros J, Joshi HC: **Opium alkaloid noscapine is an antitumor agent that arrests metaphase and induces apoptosis in dividing cells**. *Proc Natl Acad Sci U S A* 1998, **95**(4):1601-1606.

39- Hitosugi N, Hatsukari I, Ohno R, Hashimoto K, Mihara S, Mizukami S, Nakamura S, Sakagami H, Nagasaka H, Matsumoto I *et al*: **Comparative analysis of apoptosis-inducing activity of codeine and codeinone**. *Anesthesiology* 2003, **98**(3):643-650.

40- Gao YJ, Stead S, Lee RM: **Papaverine induces apoptosis in vascular endothelial and smooth muscle cells**. *Life Sci* 2002, **70**(22):2675-2685.

41- Yin D, Woodruff M, Zhang Y, Whaley S, Miao J, Ferslew K, Zhao J, Stuart C: **Morphine promotes Jurkat cell apoptosis through pro-apoptotic FADD/P53 and anti-apoptotic PI3K/Akt/NF-kappaB pathways**. *J Neuroimmunol* 2006, **174**(1-2):101-107.

42- Jaume M, Jacquet S, Cavailles P, Mace G, Stephan L, Blanpied C, Demur C, Brousset P, Dietrich G: **Opioid receptor blockade reduces Fas-induced hepatitis in mice**. *Hepatology* 2004, **40**(5):1136-1143.

پوختە

ئالودەبوون بە ئەفیۆن و لێکچوونەکانی بە یەکێك لە گرفتە جیهانییەکان دادەنرێت. ئامانج سەرەکی ئەم توێژینەوەیە بریتیە لە دیاری کردنی ئەو ماددە کیمیاییانەی کە بەرگری لەش دەگۆرن و دیارکەری ئۆکسانەکانی جگەر و مردنی خانە لە جورجی ئالودە بوو بە ئەفیۆن. 30 جورجی نێرە بە شێوەیەکی هەرەرمەکی دابەشکرا بۆ سێ گرووپ : گرووپی 1 بە کۆنترۆل دانرا بەلام لە گرووپی 2 و 3 ، جورجەکان مامەلە پێکران لەگەل دەرزی ئەفیۆن (25 و 50 ملگم ئەفیۆن/ کیلۆ لە کێشی لەش) بۆ ماوەی حەوت رۆژ. ئاستی MCP-1 لە خوێن دیاری کرا بە کیتی ELISA. و ئاستی ئەنزیمەکانی ALP,XO, G6PDH, LDH لە سیرەمی خوێن دیاری کرا جگە لە ئاستی MDA . هەروەها رێژەی خانەی مردووی جگەر دیاری کرا. زیادەیەکی دیار لە ئاستی MCP-1 دەرکەوت لە سیرەمی خوێن. ئاستی هەریەك لە ALPو XO و رێژەی مردنی خانەکانی جگەر بەرز بووەوە بەڕێی جورعەی دەرمانەکە، کە چی MDA لە هەردوو جورعە وەك یەك بەرز بوەوە. بەلاّم G6PDH بە شێوەیەکی دیار ئاستی نزم بوەوە. ئەم توێژینەوەیە دەریدەخات کە لێدانی دەرزی ئەفیۆن دەبێتە هۆی تێکچوونی بەرگری لە رێگەی زیادبوونی MCP-1 و هەروەها دەبێتە هۆی تێکچوونی بەلانسی ئۆکسان و دژە ئۆکسان لە جگەر ئەمەو جگە لە مردنی خانەکانی جگەر بە پێی جورعەکانی ئەفیۆن.