Factors affecting the clinical picture & prognosis of puffer fish poisoning in Suez city "Egypt" during year of 2008

Presented

By

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Introduction

- Marine toxins is a vague area for physicians and clinical toxicologist in Egypt.
- Puffer fish contains one of the most potent marine toxins which is called tetrodotoxin .
- Tetrodotoxin is a neurotoxin and has a severe dangerous effect for the life .
- In Japan , puffer fish poisoning is the most common cause of fatal food poisoning .
- In Egypt, many physicians observed sporadic cases of puffer fish poisoning .

- In the last ten years , the rate of these cases was progressive increased and made many troubles for physicians and people because of wide extreme of different clinical pictures and prognosis.
- In Suez city, many people eat puffer fish without appearance any toxic manifestations, but some of them complain of different toxic signs and symptoms without any residual affection and the others die .

Aim of the work

- Attraction of health professional attention to importance of toxicity puffer fish which is a common form of poisoning in Egyptian coastal cities such as Suez city .
- Determination of factors affecting the clinical picture and outcome of puffer fish poisoning for early and clear diagnosis.

Patients and Methods

- The study was carried out in General Suez Hospital.
- Nine patients from different families with different ages and sex were admitted with history of puffer fish ingestion.
- Source of contamination was puffer fish which was caught from the red sea, especially the Suez Gulf .
- Suez gulf was free from any contamination (microbial contamination and water pollution).
- Researchers of National Institute of Oceanography and Fishery (Suez branch) proved that Suez Gulf was free from any pollution during the same period of the research after investigation of multiple and frequent samples of water and fish

- Puffer fish poisoning was diagnosed on the basis of recent dietary history and clinical picture.
- All patients ate one fish and average amount of boiled rice .
- No any medication was taken before the admission.
- All cases were clinically examined, investigated and observed from admission to discharge for the following parameters :

  - Onset of symptoms.
  - Clinical manifestations.
  - Complete blood picture .
  - Renal functions ,(SGPT), (SGOT).
  - Blood glucose, Electrolytes (Na, K, Ca, P).

Clinical picture was divided into grading according to clinical grading system (Wan et al., 2007) .

Grade I : Perioral numbness and paraesthesia.

Grade II : Numbness of tongue, face and other areas, in-coordination and slurred speech .

Grade III: Flaccid paralysis, dyspnoea and aphonia .

Grade IV: Respiratory failure and coma .

- **All patients treated with :-**
  - **Gastric lavage for one time in emergency room.**
  - **Multiple doses of activated charcoal for the first two days of admission.**
  - **Symptomatic treatment .**

Results

Table (1) : The relationship between the grade of severity of puffer fish poisoning and number of intoxicated patients .

Grade	I	II	III	IV
N. Patients	3	3	-	3

Total number of the patients was **nine**
three patients had **grade I**
three had **grade II**
three fatal cases had **grade III**
later on, their condition was deteriorated and had **grade IV** .

Table {2}: Vital signs and system affection of all puffer fish intoxicated patients during admission in the hospital.

V / C	Blood pressure	Pulse	Respiratory rate	°Temperature	System affection
1	120/70	85	25	37.8	CNS Paraesthesia
2	130/90	90	24	37.5	CNS Numbness of tongue
3	100/60	85	19	36.8	CNS Incoordination
4	110/75	75	20	37.2	CNS Slurred speech
5	150/95	90	21	37.4	CNS Paralysis CVS Hypertension
6	120/85	70	22	37.2	CNS Perioral numbness
7	140/90	90	22	37.5	CNS Paraesthesia CVS Dyspnoea
8	110/60	80	18	37.3	CNS Coma
9	110/70	90	20	36.3	CNS Coma

Table (3): Relationship between clinical grading system of puffer fish poisoning, onset of symptoms, eaten part of fish and outcome of all intoxicated patients .

Patient	Onset of symptoms (Minutes)	Grade of poisoning	Eaten part of fish	Outcome	Cause of death
1	>30	4	Gonads + Flesh	Death	R.F
2	>30	1	Flesh	Recovery	-
3	>30	2	Flesh	Recovery	-
4	<30	1	Flesh	Recovery	-
5	30-60	4	Head + Flesh	Death	R.F
6	30-60	2	Soup + Flesh	Recovery	-
7	30-60	2	Flesh	Recovery	-
8	<30	4	Head + Flesh	Death	RF
9	<30	1	Flesh	Recovery	-

Table (4): The relationship between number of fatal cases and method of cooking of puffer fish.

Total number of patients	Method of cooking	Number of fatal cases
6	Frying	2
3	Boiling	1

- Out of six patients who ate fried fish only two patients died, while out of three patients who ate the boiled fish only one died.
- Method of cooking had not any effect on the prognosis.
- Method of cooking of high degree temperature had not any effect on efficacy of tetrodotoxin because it is a heat stable .

Table (5): Renal functions of all puffer fish intoxicated patients .

C / R.F	Reference range	1	2	3	4	5	6	7	8	9
S.Creatinine	0.6 - 1.4	0.6	0.7	0.8	0.9	0.9	0.9	1.1	1.2	1
S.Urea	15-45	25	33	29	32	38	27	39	35	30

Table (6): Liver functions of all puffer fish intoxicated patients .

C / L.F	Reference Range	1	2	3	4	5	6	7	8	9
S.G.P.T	Up to 49	12	18	17	15	17	13	40	42	20
S.G.O.T	Up to 49	14	30	20	17	22	20	35	38	13

Table (7) : Parameters of complete blood pictures of all puffer fish intoxicated patients .

C / P	1	2	3	4	5	6	7	8	9	Reference range
WBCs (10/mm)	8	9.4	9.7	5.5	5.3	10	8.1	6	8	(4-11)
Hb (g/dl)	11	13.2	13.5	12.5	12.6	11.5	14.1	13	14	M (14-18) F (12-16)
RBCs (10/mm)	4.1	4.5	4.4	4.6	4.2	4.2	4.9	4.8	4.9	F (4.5-5.5) M (4.5- 6)
HCT %	33	38.6	38.8	36	37	34	44.6	43	45	33 -46
MCV(fl)	81.3	84.9	85.2	83.9	86.2	82	91.2	90	92	80-96
MCH (pg)	28	29.9	31.7	31.2	31.4	30	32.2	30	31	27-34
MCHC (g/dl)	30	33	33.3	33.8	33.2	31	35.4	34	35	30-36
PLT (10/mm)	220	294	259	240	286	260	185	190	249	150-400

Table (8): Serum electrolytes (sodium, potassium, calcium and phosphorous) and blood glucose levels of all puffer fish intoxicated patients .

C / Electrolytes	Reference range	1	2	3	4	5	6	7	8	9
R. glucose (mg/dl)	<200	100	110	102	96	84	156	110	100	116
Ca (mg/dl)	8.5-10.5	9.2	9.4	8.7	8.8	9.2	9.1	9	9.2	8.8
P	2.5-5	5.6	4.3	3.4	3.3	2.8	3.7	4	3.5	3.2
Na (mEq/L)	135-155	150	160	140	164	139	140	145	150	142
K (mEq/L)	3.4-5.3	3.4	3.6	3.5	3.9	3.3	4.5	4.6	4.2	3.8

Conclusion

- Diagnosis of puffer fish poisoning depends on clinical picture and history of ingestion .
- Clinical picture of intoxication is mainly neurological, especially sensory.
- Git and cardiovascular manifestations are not common in the most patients .
- Factors affecting severity and prognosis of puffer fish toxicity are the mode of preparation and the eaten part of the fish .
- The best method of preparation of puffer fish meal depends on the removal of viscera and skin .

Thank you