REPORT ON CLINICAL STUDY
OF
ILTEHAB-E-KABID HAD
(INFECTIVE HEPATITIS)

CENTRAL COUNCIL FOR RESEARH IN UNANI MEDICINE
MINISTRY OF HEALTH AND FAMILY WELFARE
GOVERNMENT OF INDIA, NEW DELHI

REPORT ON CLINICAL STUDY OF ILTEHAB-E-KABID HAD (INFECTIVE HEPATITIS)

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Foreword

Central Council for Research in Unani medicine with its holistic view of human health is engaged in multifaceted research work with its large network spread over in all parts of the country is determined to evolve an integrated and efficacious health care structure. Of late, there is a growing global interest in the Unani system and other traditional systems of medicine. The beauty of all these systems is to promote harmonious relationships between body, mind and soul.

Jaundice has been traditionally managed by Indian Systems of Medicine. Contribution of Unani System in the treatment of Jaundice has got legendary frame. This experience has been a subject of constant research even to the researchers of modern science.

Liver is one of the most important organs of the body involved in a large number of metabolic functions. There has been a lot of resurgence in the study of a number of liver disorders and their management particularly after the development of a series of liver function tests. However, we are yet to develop simple and efficacious cures for several liver disorders in modern medicine. On the contrary, the Unani System of Medicine is known to have some very effective remedies.

The Central Council for Research in Unani Medicine is busy doing systematic research on various clinical conditions. The drugs employed are those which are reported in main classics and have been in vogue for centuries. The council has put them to scientific test employing all modern parameters. The study was carried out at two centres viz. Central Researh Institute for Unani Medicine, Hyderabad and Regional Research Institute of Unani Medicine, Madras.

The present report deals with the work carried out at Madras Centre. The results achieved are promising, particularly in the context of marked change in the prescribed markers. The team of research workers under the able supervision of Prof. Hakim S. Khaleefathullah has done a very good work.

We publish this report as a prelude to evolving a consensus on future strategy for management of jaundice. Suggestions for improvement in the design of the study, protocol or management approach are welcome.

R.K. MUKHI
Director, CCRUM
&
Director (ISM),
Ministry of Health & F.W.

PREFACE

The Regional Research Institute of Unani Medicine, Madras was established on 6th July 1979 and was formally inaugurated on 28th October, 1979. The building and land, housing this Institute at No.1, West Mada Church Street, Royapuram, Madras-13, were placed at the disposal of the Central Council for Research in Unani Medicine, New Delhi by the Government of Tamil Nadu.

The Scientific Advisory Committee of the Central Council for Research in Unani Medicine, New Delhi has allotted the following problems for carrying out research apart from the General Out Patient:-

1. Daul Feel (Filariasis)
2. Humma-E-Ejamia (Malaria)
3. Ziabetes Sukkari (Diabetes Mellitus)
4. Falij-E-Nisfi (Hemiplegia)
5. Wajaul Mafasil (Rheumatoid Arthritis)
6. Iltehab-E-Kabid Had (Infective Hepatitis)
7. Rabu-E-Nazli (Tropical Pulmonary Eosinophilia)
8. Mana-e-Hamal (Antifertility)

The then Director of Central Council for Research in Unani Medicine, New Delhi, Hakim M.A. Razzack has given full encouragement and support in not only establishing but also in equipping the Institute in the short span of period

The encouragement and support given to this Institute by various other Directors namely Mr. Goel, Hakim A.M.Ansari, Hakim (Mrs.) Ummul Fazal and Mr.R.K.Mukhi is the prime factor in bringing out the research work done at this Institute in the form of Report on the Clinical Studies on Iltehab-e-Kabid Had (Infective Hepatitis) with Unani Drug.

The problem of Iltehab-e-Kabid Had (Infective Hepatitis) has attracted many patients and a pilot study of 290 cases, were undertaken at te Regional Research Institute of Unani Medicine, Madras.

I take pleasure in submitting the Monograph on Clinical Study of Iltehab-e-Kabid Had (Infective Hepatitis), whih I feel, will be of scientific importance not only to Unani Physicians but also to colleagues of various other Systems of Medicine.

This monograph gives details about clinical study in cases of Iltehab-e-Kabid Had (Infective Hepatitis), Botany, Pharmacognosy and Chemistry of its main ingredients Tukhm-e-Kasni and also the Chemistry of other two ingredients of the research medicine. The Pharmacology of the Unani Research drug also finds a place as a separate chapter. This has given us an opening for doing more elaborate research in the field of other similar problems. I am extremely thankful to

Dr.H.P. Sharma, Project Officer and his team of research workers, Drug Standardisation Research Unit, National Botanical Research Institute, Lucknow for working on the pharmacognosy and chemistry of the Tukhm-e-Kasni and Dr.T.R. Radhakrishnan, Project Officer and his team of research workers of the Drug Standardisation Research Unit, Post Graduate Department of Chemistry, New College, Madras for working on the Chemistry of Naushadar and Honey.

HAKIM SYED KHALEEFATHULLAH
HONORARY PROJECT OFFICER

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nd his team of
Department of
Honey.

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CLINICAL STUDIES

CONCEPT OF YERQUAN (JAUNDICE) IN UNANI MEDICINE

Yerquan (Jaundice) has been defined by ancient Unani physicians as visible yellow or black discolouration of conjunctiva and skin due to diffusion of yellow or black bile in blood towards skin with or without putrification.

Buqrat (Hippocrates)- 460 BC, the father of medicine while describing Yerquan in 'Qanoncha Buqratiya' says:

اذا صفّر جلد الانسان وحد قتاه بعد ادمان الاطعمة الغليظة ولم يكن به حمّى فهو اليرقان

Yerquan in characterised by discolouration of conjuctiva and skin with or without accompanying fever, and is caused by continuous use of impure diet.

Buqarat (Hippocrates) in 'Jawamiul-ilaj-e-wal-Araz' as quoted by Razi in 'Kitab-ul-Havi' also says:

قد يعرض ضرب من اليرقان لسوء مزاج حار في العروق يقلب الدم الى الصفراء .

Sometime yerquan is caused by Su-e-Mizaj Har (Altered hot temperament) of blood vessels due to which khilt-e-dam (blood) is changed in khilt-e-safra (yellow bile).

Aflazanoos (before Gallen) as quoted by Jalinoos (Galen) in Kitab-ul-Fosool and reported by Razi in Al Havi Fit-Tib says:

قد يكون اليرقان من سخونة مزاج العروق نفسها فتجعل الدم مراريا

Yerquan occurs due to altered hot temperament of blood vessels which converts Khilt-e-Dam into Safra.

Jalinoos (Galen) (1320-200 AD) as quoted in Razi's Al Havi describes causes and types of Yerquan as :

انه ، قد يكون اليرقان على طريق البحران والكبد سليمة وقد يكون كثيرا اذا فسد الدم كله من لذع العوام ا عن الاطعمة الموجبة لذالك من غير ان يكـــون في الكبد سدة ولا ورم حار قال قد يكون اذا ضعفت المرارة عن الجذب للغلط المراري

Sometimes insect bites and consumption of certain poisonous articles in food cause toxicity in blood (Haemolysis) and imbalance of khilt-e-safra resulting in Yerquan-e-Sammi (Toxic Jaundice). He further indicates that Yerquan is also caused due to Sudde Kabid (obstruction in liver) when it is known as Yerquan-e-Suddi (obstructive Jaundice)-

Warm-e-kabid Had (acute hepatitis) and inability on the part of Miraaha (Gall Bladder) to properly absorb Khilt-e-Safra (Bile) as causes of Yerquan is also mentioned.

Ibn-e-Maswah (as quoted by Razi in Al Havi) states:

اليرقان يحدث عن المرارة و من الكبد ومن مجاري المرة ومن العروق كلها و مـــن الاغذية والسموم ومن البحران فاما في امر الكبد فاذا حدثت فيها سدد أو اورام صلبة تسد اورفوة تبطل قوتها و فعلهـــا .

Yerquan is caused by abnormal function of Mirara (Gall bladder), Kabid (Liver), Bile ducts and blood vessels, consumption of poisonous food and due to 'Bohran' (crisis and lysis). The abnormal liver functions are due to obstruction and inflammation of liver.

Abu Sahal Masihi (as quoted in Al Hawi) states :

قد يكون يرقان عن شدة حرارة المرارة و الكبد قال وهذا يصفر منه جميع البـــدن خلا الوجه فانه يسود و يجف الجسم مع ذلك و يبيض اللسان ويحتبس البطن وينتفخ

Yerquan is caused by Hararat-e-Kabid and Mirara (Altered temperament of liver and gall bladder) and various signs and symptoms which develop as a result of the altered temperament are skin discolouration, coated tongue, constipation, loss of body weight and epigastric & intestinal discomfort.

Rabban Tabari (810-895 A.D.) while describing Yerquan in his famous book Firdaus-ul-Hikmat says:

فاما اليرقان فيكون من اربع علل اما ان تعرض في المرارة فتحول بينها و بين ان تجذب الصفراء من الكبد فتبقي الصفراء في الكبد وتختلط بالدم الذى منه غذاء البدن ثم تجرى الى البدن فيكون منه اليرقان ، واما ان تدفع الطبيعة المر الصفراء الغليظة في يوم البحران من اخراج ما يجتمع فيها من المرة فتراجع ذلك الى الكبد وتختلط بالدم ثم تجرى الى البدن كله فتصفره ويكون اليرقان من لذع الهوام ايضا و من السواد فيسود منه البدن.

Yerquan is caused by four major abnormalities

1. Sudd-e-Mirara (obstruction in gall bladder) preventing normal flow of bile from liver to gall bladder, hence allowing its diffusion in blood causing Jaundice known as Yerquan-e-Suddi (obstructive Jaundice)

2. Diversion of excessive bile from gall bladder towards skin by Tabiat-e-Mudabirre-e-Badan (constitutional force of body) for excretion in sweat, resulting in its accumulation due to high concentration in the subcutaneous tissue causing discolouration & Jaundice.

3. Weakness of gall bladder due to some reason causing diffusion of bile in liver and finally yellow discolouration of body.

4. Toxicity due to insect bites which leads to causation of Jaundice (Toxic Jaundice).

He has also said that it is not only Safra (yellow bile) that causes jaundice but also Sauda (black bile) is responsible.

Zakariaya-Al-Razi (Rhazes) (850-925 AD) while describing this disease in his most esteemed work 'Al Hawi' says :

أصحاب اليرقان متى لم تنق ابدانهم من المرار حدثت عليهم حميات وذلك انه لابد للخلط المرارى الذى هو ذاهب فعه الطبيعة عن البدن اذا هو لم يخرج ان يعفن فان كان سبب اليرقان ورما في الكبد او سددا فانه كان في استجلاب الحمى ،

Excretion of Khilt-e-Safra (yellow bile) by Tabiat-e-Muddabar-e-Badan is necessary in Jaundice. If excretion fails to occur, yellow bile putrefies resulting in fever. Fever is also present in Jaundice due to inflammation and obstruction of liver.

Ibn-e-Sina (Avicenna) (980-1037) AD) in his medical encyclopaedia 'Al Qanoon Fit-Tibb' says:

اعلم ان اليرقان تغير فاحش في لون البدن الى صفرة أوسواد لجريان الخلط الاصفر أو الاسود الى الجلد وما يليه بلا عفونة ولوكانت لصحبها غبّ في الصفراء أو ربع في السوداء ، وسبب الاصفر في اكثر الامر هو من جهة الكبد ومن جهة المرارة وسبب الاسود من الطحال وقد يكون من الكبد وقد يتفق ان يكون سبب الاصفر والاسود معا .

Yerquan is visible discolouration of body (yellowish or blackish) due to diffusion of yellow or black bile from blood to skin with or without putrification. In case of putrification, Huma-e-Gib (Tertiary fever) and Huma-e-Rub (Quartan fever) appears in yarquan-e-sufaravi and yerquan-e-saudavi respectively. The lesion of yerquan-e-asfar is mostly liver or gall bladder and that of yerquan-e-Aswad is spleen and sometimes liver also. Rarely yerquan-e-Asfar and Aswad are present together.

Nafis Bin Auz in his famous book Moalijit-e-Nafisi says:

اليرقان تغير فاحش يخرج عند التغير الحادث عن الغضب والفزع وما يشبه ذلك من اللون يخرج عند التغير الحادث من المقدار كالنمو والذبول الى صفراء تارة والى سوداء تارة أو الى اجتماعهما تارة .

Yerquan is characterised by change of normal colour of skin to yellowish or black due to provocations or anxiety resulting in excessive production of Safra (yellow bile) and sometimes Sauda (black bile). At times yellow and black bile is produced simultaneously in excess causing jaundice. Hakim Akbar Arzani (17th century), one of the eminent Indian physicians in his book Tibbe Akbar says :

يرقان وى أنست كه رنگ بدن تغير فاحش پذيرد بزردى يا بساهى بحسب لون خلط فاعل ، وبايد دانست كه مادة يرقان دراكثر بغير عفونت باشد.

The visible discolouration of body is due to predominance of affected humour i.e. Safra (yellow bile) or Sauda (Black bile) and mostly involved humour does not putrify.

Hakim Az am Khan (19th Century) in his book Ikseer-e-Azam says:

یرقان وآن تغیر فاحش است در رنگ بدن بزردی یا سیاهی بسبب جریان خلط صفرا یا سودا بسوئے جلد ومتصل آن بلاعفونت واکر عفونت باو لازم بودے تپ غب دریرقان اصفر وتپ ربع در اسود همراه آن بودی، یرقان اصفر اوآنست کہ چشم وتمام بدن در آن زرد شود ۔

"Yerquan is yellowish or blackish dicolouration of body due to excessive flow of yellow or black bile towards skin and its adjacent parts with or without putrification. In case of putrification the yerquan-e-asfar and yerquan-e-aswad will follow Humma-e-Ghib (Tertiary fever) and Humma-e-Rub (Quartan fever) respectively. Eyes and whole body become yellow in Yerquan-e-Asfer".

The views of Arzani and Khan have also been shared by other Indian Unani Physicians like Hakim Sadiq Ali in 'Makhzin-ul-Taleem', Hakim Mansoor Bin Mohammad Bin Yusuf in 'Kifay-e-Mansoori' and Hakim Sultan Ali Tabeeb Khurasani in 'Dastural Ilaj'.

CLINICAL FEATURES AND DIAGNOSIS

In Unani System of Medicine pulse, urine and stool examination are important criteria in the diagnosis of diseases, while describing Yerquan (Jaundice) almost all physicians have given emphasis on pulse and naked eye examination of urine and stool of patient.

According to Jalinoos (Galen) as reported by Razi in Al Havi-Fit-Tibb the colour of urine, faeces and sweat varies from light to dark yellow. He has also clarified that urine of patient in Warm-e-Kabid Had (Acute Hepatitis) is reddish brown. Galen has gone to the extent of differentiating between Acute Hepatitis and chronic hepatitis and according to him enlarged liver becomes comparatively hard in latter variety.

Ahran as quoted in 'Al Havi-Fit-Tib' holded the view that patient of jaundice passes colourless (clay coloured) stool and brown coloured urine. These views have also been shared by Rofs, Bols, Maseeh, Ibn-e-Maswah and author of Kitab-ul-Huqan (as reported by Razi in Al Havi) and Rabban Tabri.

Bols (as quoted in Al Havi) also described pain and tenderness in hypochondrium suggestive of acute inflammation of liver.

Scholars like Ibn-e-Maswah, Maseeh (quoted in Al Havi) and Rabban Tabri have mentioned following points in description and diagnosis of acute hepatitis.

1. Heat in hepatic region
2. Heaviness in hepatic region
3. Pain and tenderness in liver
4. Excessive thirst
5. Dryness of tongue
6. Constipation

In addition to above features as reported by Tabri and others Avicenna while describing clinical features and diagnosis of hepatitis has mentioned following additional points

1. Anorexia
2. General weakness
3. Pruritis
4. Soft hepatic enlargement
5. Hard hepatic enlargement (which is rare)

Avicenna also mentioned that obstructive jaundice usually presents.

1. Acute constipation
2. Severe nausea and
3. Severe pain in hepatic region

Pulse of the patient has been described as Sagheer (small) by Avicenna and a many other Unani Physicians.

LINE OF MANAGEMENT

While describing management of Yerquan (Jaundice) Unani Physicians have given top priority to the eradication of the cause of the disease.

In the treatment of non-obstructive hepatic jaundice, anti-inflammatory drugs, diuretics and purgatives of Safra (yellow bile) are mentioned in classical literature of Unani System of Medicine. Whereas in hepatic jaundice with obstructive symptoms, in addition to anti-inflammatory agents, deobstruents, demulcents and detergents have been reported. Jalinoos (Galen) (as quoted in Al Hawi) has claimed that with such line of treatment patients get cured in shortest time.

Use of antipyretic drugs and Zamad of Sandal (external application) on hepatic region has been advocated by Maswah (as quoted in Al Hawi).

In addition to drug therapy, role of diet in the treatment of Jaundice has not been ignored by Unani physicians. Light diet which is easily digested, absorbed and assimilated have been advocated in the Unani literature. Use of butter milk and fish with venegar has been advocated by Maswah (quoted in Al Hawi) and Razi. Different types of fruits are also reported to be useful in the treatment of Jaundice.

MODERN MEDICINE CONCEPT

The accumulation of bile pigment in the serum associated with a yellow discolouration of the skin, conjunctiva and mucous membranes is called Jaundice. The level of serum bilirubin has to reach approximately 3mg/dl before such a change is noted clinically.

There are classifically three types of Jaundice, These are 1) obstructive Jaundice, 2) Liver Cell Jaundice and 3) Haemolytic Jaundice.

1. Obstructive Jaundice

In this situation there is obstruction either in the common bile-duct, both hepatic ducts, or in the biliary ductless or canaliculi inside the liver. It can therefore be classified as either intra or extra hepatic.

2. Liver cell Jaundice:

In this condition there is a failure of the liver cell to take up and conjugate bilirubin and to deliver it to the biliary canaliculi for excretion.

3. Haemolytic Jaundice :

In this situation which is accompanied by haemolytic anaemia the amount of bilirubin delivered to the liver is in excess of its excretory capacity. It therefore collects in the serum in the unconjugated form.

LIVER CELL JAUNDICE:

Aetiology:- The usual causes of liver cell Jaundice are two, namely hepatitis usually due to the viruses of infective or syringe hepatitis and the action of certain poisons and drugs. A classical example of this latter is carbon tetrachloride, used in fire extinguishers and dry cleaning, which causes severe fatty infiltration of the liver and other organs. Other examples of drugs causing liver cell injury include the monoamino oxidase inhibitors used in the treatment of depression and the anaesthetic agent halothane.

Clinical picture :- The onset of liver cell Jaundice is usually rapid, the degree of Jaundice increasing to a maximum within a day or two of the onset of the disorder. The patient often feels unwell, there is not usually persistent itching and on examination the liver may be enlarged or decreased in size and there may be splenomegaly. It is important to look for evidence of chronic liver-cell disease as a basis for acute liver cell dysfunction, so that signs like spider naevi, palmer erythema, gynaecomastia, and clubbing are important. If liver cell Jaundice is severe then the patient may show evidence of a bleeding tendency and there may be evidence of hepatic encephalopathy and oedema formation, the latter due to a fall in the serum albumin levels.

Diagnosis :- The liver function tests apart from showing a high serum bilirubin show abnormal flocculation tests, a rise in the B and Y globulins, a normal or raised alkaline phosphatase, and most important of all, considerable elevation of the transaminanses. In patients with acute liver cell disease associated with necrosis of the liver, there may be poly-morphonuclear leucocytosis in the peripheral blood. The urine of patients with liver cell Jaundice contains bile pigment and an excess of urobilin or urobilinogen may be demonstrated.

OBJECTIVE OF STUDY

The survey of classical literature of Unani Systems of Medicine reveals that many drugs of herbal, mineral and animal origin are reported to be effective in the treatment of Iltehab-e-Kabid Had (Infective Hepatitis) but no scientific data is available to supplement these reports. Keeping this in view and also that no radical treatment is available in conventional modern system of medicine, scientific studies have been undertaken by Central Council for Research in Unani Medicine to evaluate the therapeutic efficacy of several unani drugs/formulations in the treatment of Iltehab-e-Kabid Had (Infective Hepatitis).

In the experiment under report IKH-4, a coded Unani formula has been tried on 290 patients and scientifically evaluated. The results thoroughly analysed and discussed.

CRITERIA OF SELECTION OF CASES

Patients predominantly presenting clinical features of the disease such as anorexia/ dyspepsia, nausea, vomiting, abdominal pain/discomfort, pruritis, constipation or diarrhea, hepatomegaly and yellow discolouration of conjunctiva, tongue, skin, nails and urine were screened and subjected to Pathological tests for presence of bile salts, bile pigments and raised urobilinogen in urine and biochemical investigations for liver function for confirmation of hepatocellurlar damage before they are included in the study. However, patients below 10 years of age were exempted from blood tests and in such cases diagnosis has been based on clinical features and presence of bile pigments/salts and raised urobilinogen in urine. Patients both with and without fever were included in the study.

INVESTIGATIONS

Pathological:- Urine - Bile salts, Bile pigments and Urobilinogen were carried out in all cases.

Biochemical:- Serum Bilirubin - Total and Direct, Thymol Turbidity, S.G.O.T., S.G.P.T, Alkaline phosphatase and LDH were carried out before starting the treatment as base line and repeated at an interval of ten days. In few cases serum cholesteral, total protein and albumin were also carried out.

DRUG, DOSE AND MODE OF ADMINISTRATION

Coded drug IKH-4 was given in the dose of 10 to 15 gms three times a day for adults and 3 to 5 gms three times a day for children in Majoon form.

CHRONICITY OF DISEASE

The chronicity of illness which varied from 1 to 60 days, was classified as upto 7 days, 8-15 days, 16-20 days, 21-30 days, 31-40 days and 41-60 days. The break up of number of patients with different chronicity is as under :

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CHRONICITY IN DAYS						TOTAL
1-7	8-15	16-20	21-30	31-40	41-60	
198	69	12	10	-	1	290

CRITERIA FOR ASSESSMENT OF RESULTS

Results were assessed on the basis of clinical relief and reduction or normalisation of raised values of biochemical & pathological parameters. On the basis of this criteria response to therapy was graded as under:

1. **Relieved (cured):-** When all the clinical findings recorded at base line disappear, values of different biochemical tests like serum bilirubin, SGPT, SGOT, Alkaline phosphatase and Albumin become normal, urine gives negative tests for bile salts/ pigments and raised urobilinogen becomes normal, the patient is said to have been relieved or cured.

2. **Partially relieved:-** When all the signs and symptoms recorded at base line disappear but the serological findings though significantly reduced do not touch normal levels and pathological findings also become normal, the patient is said to be partially relieved.

3. **Not relieved:-** When there is no significant subjective improvement in the clinical condition of the patient and laboratory findings also remain unaltered, the patient is taken as not relieved.

OBSERVATION

It is seen that 82 cases (49 males and 33 females) showed complete normalisation of clinical, pathological and bio-chemical parameters at the end of 10th day of treatment. 1 male and 1 female were partially relieved and 1 male had no relieve (Table I).

In 97 cases which continued the treatment upto 20 days, 67 males and 30 females showed complete normalisation in all the parameters (clinical, pathological and bio-chemical) at the end of the 20th day. 1 male and 4 females were partially relived. (Table IA).

TABLE SHOWING CHRONICITY AND RESPONSE TO TREATMENT

Table - I.

Chronicity	Relieved	Partially relieved	Not relieved	Total
1-7 days	184	8	6	198
8-15 days	63	4	2	69
16-20 days	10	1	1	12
21-30 days	8	1	1	10
31-40 days	-	-	-	-
41-60 days	1	-	-	1

The chronicity of illness upto 60 days does not seem to affect response to present therapy as is evident from the fact that in all cases the response in highly encouraging.

THE THERAPEUTIC RESULTS OF "ILTEHAB-E-KABID HAD" (JAUNDICE) PATIENTS TREATED WITH CODED DRUG "IKH4"

Table-I A

Treatment Days	Patient's Sex	Therapeutic Results			Total
		Relieved	Partially Relieved	Not Relieved	
10 Days	Male	49	1	1	51
	female	33	1	-	34
20 Days	Male	67	1	-	68
	Female	30	4	-	34
30 Days	Male	61	6	6	73
	Female	26	1	3	30
Total		266	14	10	290

ATMENT

	Total
	198
	69
	12
	10
	-
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AD" (JAUNDICE)

s	Total
lot ieved	
1	51
-	34
-	68
-	34
6	73
3	30
10	290

Out of 103 cases, which continued treatment upto 30 days, 61 males and 26 females showed complete relief in all the parameter, clinical, pathological and bio-chemical. 6 males 1 female were partially relieved and the symptoms were not relieved in 6 males and 3 females at the end of 30th day (Table I). Age-wise group classification of the patients (Table II).

RESULTS

Out of 290 cases treated with coded drug IKH_4, 266 were completely relieved, whereas, 14 had partial relieve and the remaining 10 had no relieve (Table I).

DISCUSSION

It is seen that out of 290 cases registered, the base line had various clinical parameters such as fever, anorexia, nausea, vomiting, pruritis, mental confusion, drowziness, abdominal pain and palpable liver. It was observed that on the first follow-up on the 10th day, except one case of mental confusion out of 2, and 49 cases of abdominal pain out of 247 cases and 56 cases of palpable liver out of 108 cases were present. Other symptoms have come down considerably (Table III).

The second follow-up on the 20th day the clinical parameters were almost controlled except in 22 cases where the liver continued to be palpable with 27 cases of abdominal pain. And at the end of 3rd follow-up only 2 cases had palpable liver.

In the base line, the patients presenting symptom of yellow colouration in the eyes was present in 290 cases. 84 cases became normal on the first follow-up. Another 132 cases at the second follow-up and 74 cases at the end of third follow-up (Table IV). Similarly the colour of the sublingual mucous membrane which was yellow in 282 cases out of 290, showed improvement as follows: 175 became normal at the first follow-up, 90 at the end of 2nd follow-up and 17 at the end of third follow-up. (Table V)

The Nazri Moiana of Boal and Baraz (Urine and motion) was also observed (Table VI). It is observed that out of 290 cases, 208 cases had Boal-e-Ashqar, 72 cases had Boal-e-Naranji-o-Nari and 10 cases had Boal-e-Ahem-r-e-Naseh. Similarly out of 290 cases, 164 cases had Baraz-e-Tabye, 5 cases Barz-e-Ahme-r-e-Naseh and remaining 121 had Baraz-e-Abiyaz at the base line. At the end of the first follow-up, 106 cases out of 126 became Tabya, at the end of second follow-up all the remaining 20 cases became normal (Table VII).

Out of 290 cases, 82 had completed remission in the clinical, pathological, bio-chemical parameters at the end of 10 days treatment (Table I, VIII, IX). Similarly 97 cases relieved in 20 days (Table I, X, XI) 87 cases at the end of the 30 days treatment (Table I, XII, XIII).

The general observation seen in all the 266 cases was that the bile salts and bile pigments in urine became negative at the end of 20 days except in one case and bio-chemical parameters almost touched normal range. The bio-chemical parameters in majority of the cases become normal but it takes longer time in few cases to settle down.

THE AGE GROUP OF THE PATIENTS TREATED UNDER THREE DIFFERENT GROUPS

TABLE - II

TREATMENT DAYS (GROUPS)	Sex and Age group (Years)		TOTAL
	MALE	FEMALE	
10days (1st Group)	1.5 - 65.0 (51)	1.5 - 38.0 (34)	1.5 - 65.0 (85)
20 Days (2nd Group)	1.5 - 65.0 (68)	1.5 - 51.0 (34)	1.5 - 65.0 (102)
30Days (3rd Group)	3.0 - 62.0 (73)	7.0 - 60.0 (30)	3.0 - 62.0 (103)
Total	1.5 - 65.0 (192)	1.5 - 60.0 (98)	1.5 - 65.0 (290)

Note : Figures within paranthesis represents no.of patients.

TOTAL 290 CASES OF 'ILTEHAB-E-KABID HAD CLINICAL SIGNS & SYMPTOMS PERSISTED AFTER 10TH, 20TH & 30TH DAY OF TREATMENT

TABLE - III

Sign & Symptoms	Base Line	10th day	20th day	30th day
Fever	44	2	-	-
Anorexia	281	16	5	-
Nausea	283	17	4	-
Vomiting	217	14	3	-
Pruritis	33	7	2	-
Mental Confusion	2	1	1	-
Drowziness	-	-	-	-
Abdominal pain	247	49	27	-
Liver (Palpable)	108	56	22	2
Spleen (Palpable)	-	-	-	-

TOTAL 290 CASES OF 'ILTEHAB-E-KABID HAD' COLOUR OF THE EYES

TABLE - IV

Colour of the eyes	Base Line	10th day	20th day	30th day
Normal	-	84	132	74
Yellow	281	201	72	-
Dark Yellow	9	5	2	-

TABLE - V

Colour of the S
Normal
Yellow
Dark Yellow

TABLE - VI

Colour of the uri
Utraji
Ashqar
Naranji-o-Nar
Ahme-r-e-Nasel

OF THE EYES

	30th day
	74
	-
	-

TOTAL 290 CASES OF 'ILTEHAB-E-KABID HAD' COLOUR OF THE SUBLINGUAL MUCOUS MEMBRANE

TABLE - V

Colour of the SMM	Base Line	10th day	20th day	30th day
Normal	8	175	90	17
Yellow	280	102	15	-
Dark Yellow	2	5	2	-

TOTAL 290 CASES OF 'ILTEHAB-E-KABID HAD' COLOUR OF THE URINE (NAZRI MOIANA)

TABLE - VI

Colour of the urine	Base Line	10th day	20th day	30th day
Utraji	-	146	120	24
Ashqar	208	106	21	-
Naranji-o-Nari	72	24	3	-
Ahme-r-e-Naseh	10	14	-	-

TOTAL 290 CASES OF 'ILTEHAB-E-KABID HAD' BARAZ-KA-NAZRI MOINA (NAKED EYE EXAMINATION OF STOOL)

TABLE - VII

Colour of the stool	Base Line	10th day	20th day	30th day
براز طبعی Baraz-e-Tabye زردی مائل	164	106	20	-
Baraz-e- Ahmer-e-Naseh براز احمر ناصح	5	4	-	-
Baraz-e-Abiyaz براز ابیض Clay Colour	121	16	-	-

ANAL

TABLE - VII

Name of the Parameters	
Bile Salts	
Bile Pigments	
Urobilino-gen	

Note : Figu

ANALYSIS OF PATHOLOGIAL PARAMETERS OF "ILTEHAB-E-KABID HAD" (JAUNDICE) PATIENTS TREATED FOR 10 DAYS

TABLE - VIII

Name of the Parameters	Unit of Measure	Base Line		After 10 days	
		Unit of Measure			
		Present/ increased	Absent/ Normal	Present/ increased	Absent/ Normal
Bile Salts	Present/ Absent	41	44	1	84
Bile Pigments	Present/ Absent	83	2	11	74
Urobilino-gen	Increased/ normal	48	6	30	55

Note : Figures noted in the two way classification cells are the No. of observations.

ANALYSIS OF BIO-CHEMICAL PARAMETERS OF " ILTEHAB-E-KABID HAD" (JAUNDICE) PATIENTS TREATED WITH CODED DRUG 'IKH-4' FOR 10 DAYS

TABLE - IX

Name of The Parameters		Unit of Measure	Statistics	DAY OF ESTIMATION	
				Base Line	After 10 Days
Serum Bilirubin	TOTAL	mg%	Mean±S.D. n: t - value p:	2.52 ± 1.63 31 -	0.97 ± 0.7 31 5.968 * <0.001
Serum Bilirubin	Direct	mg%	Mean±S.D. n: t - value p:	1.4 ± 1.0 31 -	0.55 ± 0.59 31 4.762 * < 0.001
S.G.O.T		U/L	Mean+S.D. n : t - value p:	137 ± 138 31 - -	49 ± 99 31 4.9491 * < 0.001
S.G.P.T.			Mean+S.D. n : t-value p:	209 ± 245 31 - -	50 ± 102 31 4.3515* < 0.001
Alk. Phos-phatase		KAU	Mean±S.D. n : t - value p	13.9 ± 9.5 31 -	10.8 ± 8.2 31 4.5684 <0.001
Thymol turbi-dity		S.H.U.	Mean±S.D. n: t - value p	7.15 ± 5.67 31 - -	5.93 ± 3.41 31 2.2876 ** <0.05
L.D.H.		I.U/L	Mean±S.D. n : t - value p:	277 ± 121 31 - -	208 ± 70 31 3.6087* < 0.001

Note : N: No. of observations; P; Probability level

* The changes are significant at 99.9% level of confidence

** The changes are signigicant at 95% level of conidence

ANLYSIS OF BIO-CHEMICALS PARAMETERS OF 'ILTEHAB-E-KABID HAD' (JAUNDICE)' PATEINTS TREATED WITH CODED DRUG 'IKH4' (YN4) FOR 30 DAYS

DAY OF ESTIMATION

ANLYSIS OF BIO-CHEMICALS PARAMETERS OF 'ILTEHAB-E-KABID HAD' (JAUNDICE)' PATEINTS TREATED WITH CODED DRUG 'IKH4' (YN4) FOR 30 DAYS

Name of the Parameters		Unit of Measure	Statistic	DAY OF ESTIMATION			
				Base Line	After 10 days	After 20 days	After 30 days
Serum Bilirubin	Total	mg%	Mean ± S.D. n: t : value p:	7.6 ± 3.8 98 -	4.0 ± 3.6 98 9.162 * -<0.001	2.78 ± 4.43 98 9.23* <0.001	2.4 ± 5.1 98 8.696 * <0.001
	Direct		Mean ± S.D. n: t : value p:	4.99 ± 2.67 98 - -	2.57 ± 2.22 98 9.3218* <0.001	1.79 ± 2.63 98 10.1* <0.001	1.38 ± 3.2 98 9.0452* <0.001
S.G.O.T		U/L	Mean ± S.D n: t : value p:	352 ± 179 98 - -	160 ± 141 98 9.8995* <0.001	83 ± 97 98 14.3107* <0.001	57 ± 88 98 16.4266* <0.001
S.G.P.T		U/L	Mean ± S.D. n: t : value p:	547 ± 314 98 - -	212 ± 158 98 11.0914* <0.001	104 ± 116 98 14.6383* <0.001	61± 102 98 15.5837* <0.001
Alk.Phos-phatase		K.A.U	Mean ± s.D n: t : value p:	25.7 ± 15.1 93 - -	9.9 ± 4.8 93 10.0243* <0.001	13.4 ± 7.7 93 9.7565* <0.001	11.6 ± 6.6 93 10.9985* <0.001
Thymol Turbidity		S.H.U	Mean ± S.D n: t : value p:	10.96 ± 5.299 98 - -	8.38 ± 3.81 98 5.7944* <0.001	6.29 ± 3.0 98 9.2027 * <0.001	5.33 ± 3.01 98 10.3364* <0.001
L.D.H		I.U./L	Mean ± s.d. n: t : value p:	303 ± 123 93 - -	217 ± 77 93 7.6273* <0.001	194± 67 93 9.3023* <0.001	194 ± 83 93 9.3830* <0.001

NOTE : n: no. of observations; p: probablility level; * The changes are significant at 99.9% level of confidence

ANALYSIS OF PATHOLOGICAL PARAMETERS OF "ILTEHAB-E-KABID HAD" (JAUNDICE) PATIENTS TREATED FOR 20 DAYS

TABLE - II

Name of the The para-meter	Unit of Measure	Base Line		After 10 days		After 20 days	
		Unit of Measures					
		Pre/Inc	Abs/Nor	Pre/Inc	Abs/Nor	Pre/Inc	Abs/Nor
Bile Salts	Present / Absent	49	53	1	101	1	101
Bile Pigments	Present/ Absent	63	39	16	86	4	98
Urobi-linogen	Increased/ Nor	61	41	73	29	32	70

Note : The figures noted in two way classification cells are the no. of observations
Pre : Present: Abs : Absent Inc : Increased; Nor : Normal

Pre : Present: Abs : Absent Inc : Increased; Nor : Normal

ANALYSIS OF PATHOLOGICAL PARAMETERS OF ' ILTEHAB-E-KABID HAD' (JAUNDICE) PATIENTS TREATED FOR 30 DAYS

TABLE - III

Name of the The para-meter	Unit of Measure	Base Line		After 20 days		After 30 days			
		Unit of Measures							
		Pre/Inc	Abs/Nor	Pre/Inc	Abs/Nor	Pre/Inc	Abs/Nor	Pre/Inc	Abs/Nor
Bile Salts	Present / Absent	60	43	19	84	4	99	-	103
Bile Pigments	Present/ Absent	102	1	65	38	17	86	7	96
Urobi-linogen	Increased/ Nor	69	34	82	21	52	51	36	67

Note : The figures noted in the two way classification cells are the no. of observations

Pre : Present; Abs : Absent Inc : Increased; Nor : Normal

TABLE IV

ANALYSIS OF BIO-CHEMICAL PARAMETERS OF 'ILTEHAB-E-KABID HAD' (JAUNDICE)' PATIENTS TREATED WITH CODED DRUG 'IKH4' (YN4) FOR 20 DAYS

Name of the Parameters		Unit of Measure	DAY OF ESTIMATION			
			Base Line	After 10 days		After 20 days
Serum Bilirubin	Total	mg%	Mean ± S.D. n : t - value p:	4.9 ± 2.9 77 - -	1.6 ± 1.0 77 12.2851* < 0.001	0.98 ± 0.41 77 13.0157* < 0.001
	Direct		Mean ± S.D. n: t - value p:	3.18 ± 2.14 77 - -	0.93 ± 0.71 77 10.7653* <0.001	0.51 ± 0.19 77 10.1877* < 0.001
S.G.O.T		U/L	Mean ± S.D. n: t - value p:	330 ±224 77 - -	86 ± 59 77 9.8167* < 0.001	41 ± 54 77 11.4872* < 0.001
S.G.P.T		U/L	Mean ± S.D. n : t - value p :	467 ± 309 77 - -	131 ± 102 77 11.4867* < 0.001	48 ± 69 77 12.2967 < 0.001
Alk. Phos-phatase		K.A.U	Mean ± S.D. n : t - value	22.7± 13.4 77 -	14.5 ±7.64 77 7.3118* < 0.001	12.1 ± 6.7 77 9.5191* < 0.001
Thymol Turbidity		S.H.U	Mean ±S.D. n : t - value p:	9.41 ±4.47 77 - -	6.32 ±2.83 77 8.0254* < 0.001	3.84 ±0.95 77 10.549* < 0.001
L.D.H I.		I.U./L	n : t - value p:	266 ± 128 77 - -	201 ± 73 77 4.9401* < 0.001	190 ± 67 77 6.1683* < 0.001

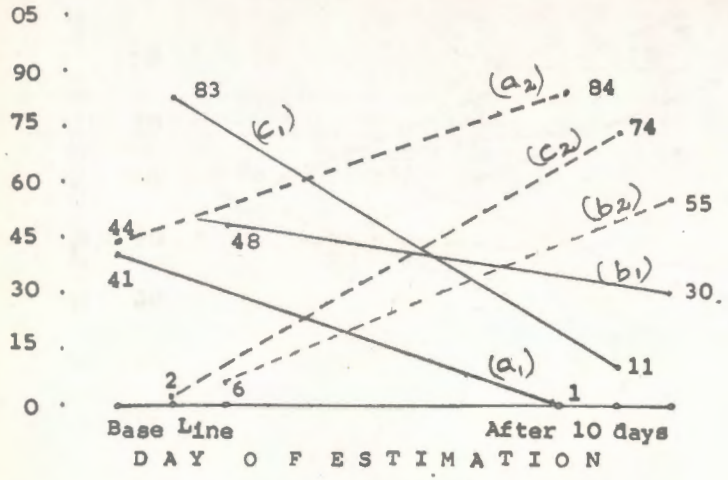
Note : n: No. of observations; P: Probability level; * The changes are significiant at 99.9% level of onfidence

THE BILE SALTS, BILE PIGMENTS, UROBILINOGEN, ALK.PHOSPHATASE AND THYMOL TURBIDITY RESULTS AT 'ILTEHAB-E-KABID HAD' (JAUNDICE) PATIENTS TREATED WITH CODED DRUG 'IKH4' (YN4) FOR 10 DAYS

		p:	-	< 0.001	< 0.001
L.D.H I.	I.U./L	n :	266 ± 128	201 ± 73	190 ± 67
		n :	77	77	77
		t - value	-	4.9401*	6.1683*
		p:	-	< 0.001	< 0.001

Note : n: No. of observations; P: Probability level; * The changes are significant at 99.9% level of onfidence

THE BILE SALTS, BILE PIGMENTS, UROBILINOGEN, ALK.PHOSPHATASE AND THYMOL TURBIDITY RESULTS AT 'ILTEHAB-E-KABID HAD' (JAUNDICE) PATIENTS TREATED WITH CODED DRUG 'IKH4' (YN4) FOR 10 DAYS



KEY:-

(a) Mean ± S.D. of Alk.Phosphatase values

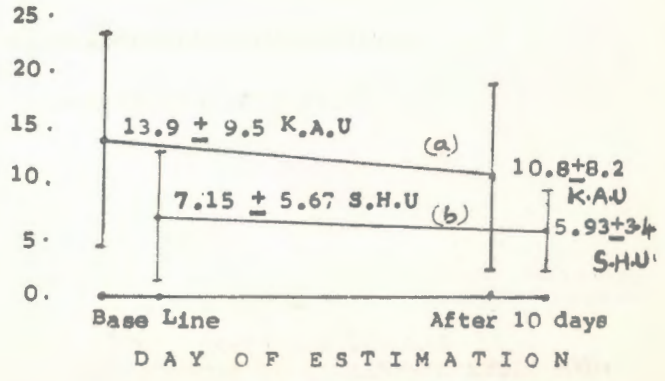
(b) Mean ± S.D. of Thymol Turbidity values

KEY:-

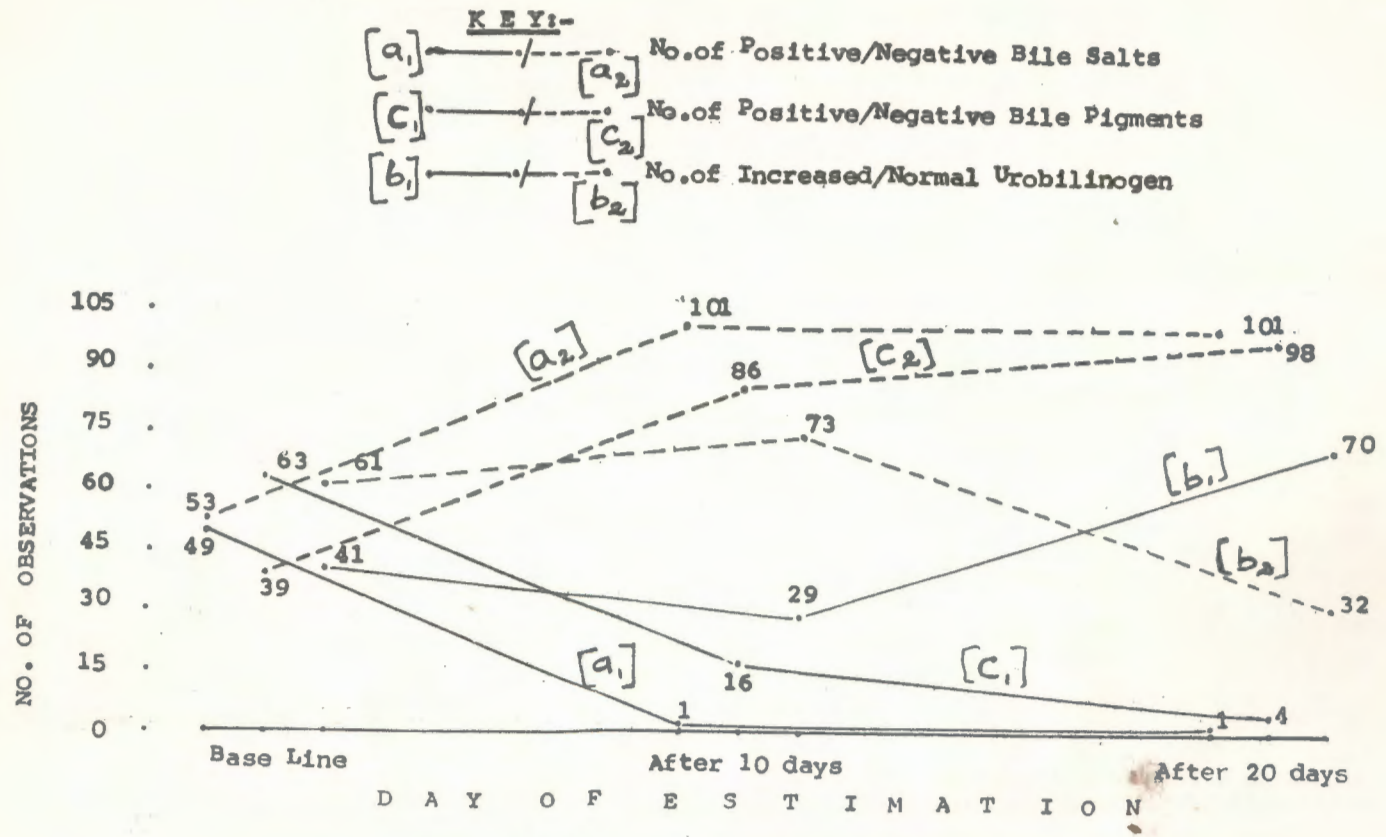
(a_1) —/— (a_2) No.of positive/negative bile salts

(c_1) —/— (c_2) No.of positive/negative bile pigments

(b_1) —/— (b_2) No.of increased/normal urobilinogens



THE BILE SALTS, BILE PIGMENTS AND UROBILINOGEN RESULTS OF 'ILTEHAB-E-KABID HAD' (JAUNDICE) PATIENTS TREATED WITH CODED DRUG 'IKH4' (YN4) FOR 20 DAYS



THE BILE SALTS, BILE PIGMENTS AND THE UROBILINOGEN RESULTS OF 'ILTEHAB-E-KABID HAD' (JAUNDICE) PATIENTS TREATED WITH CODED DRUG 'IKH4' (YN4) FOR 30 DAYS

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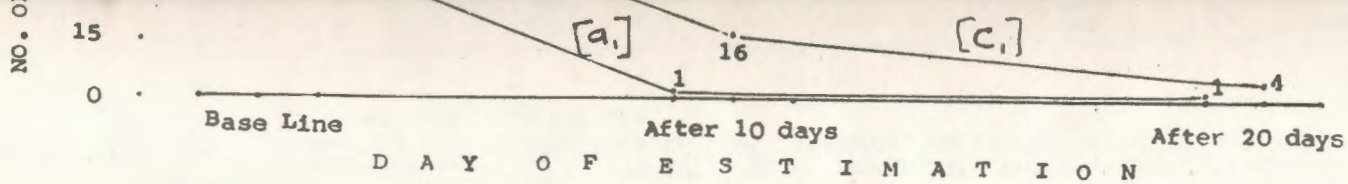

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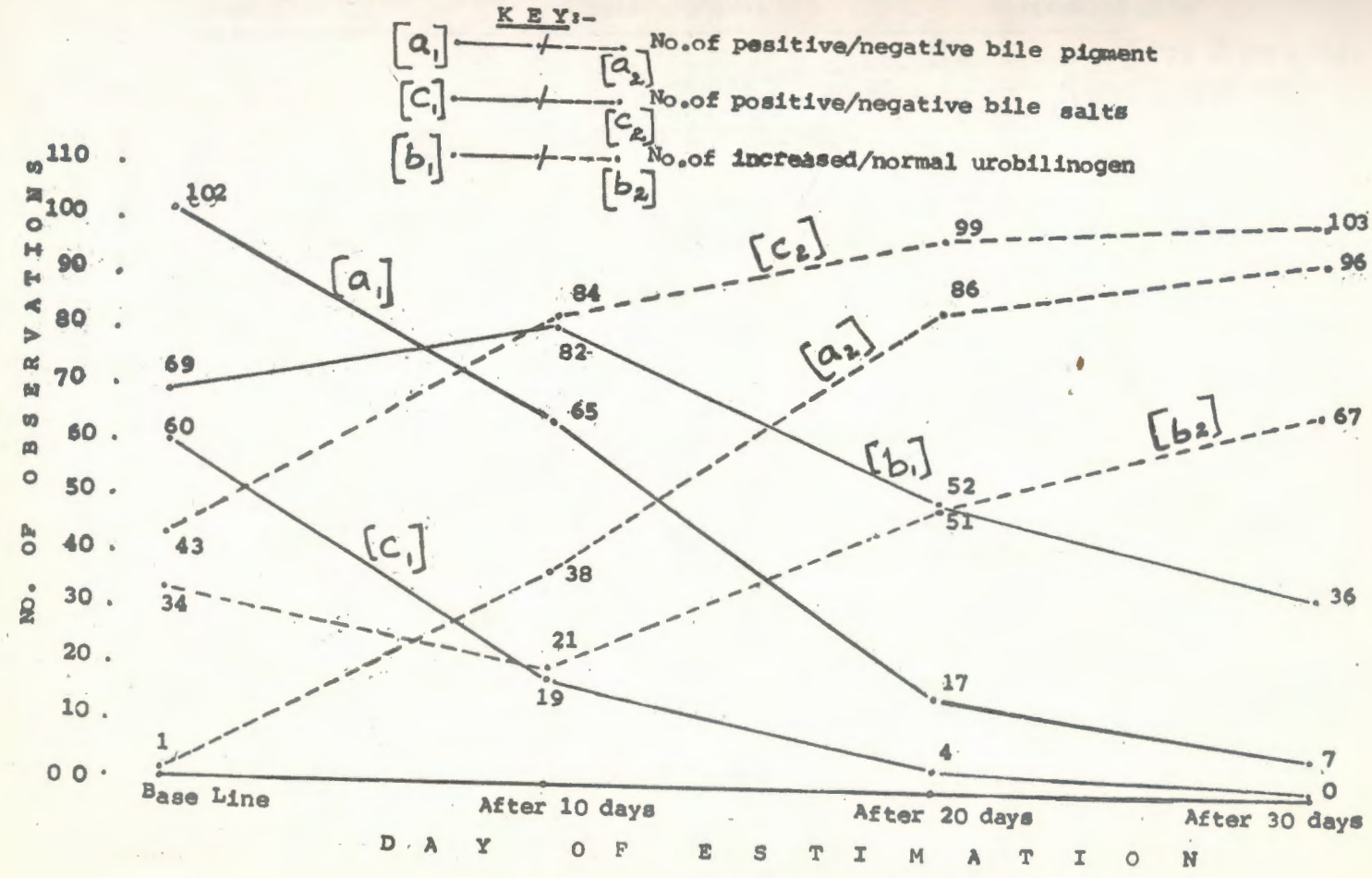
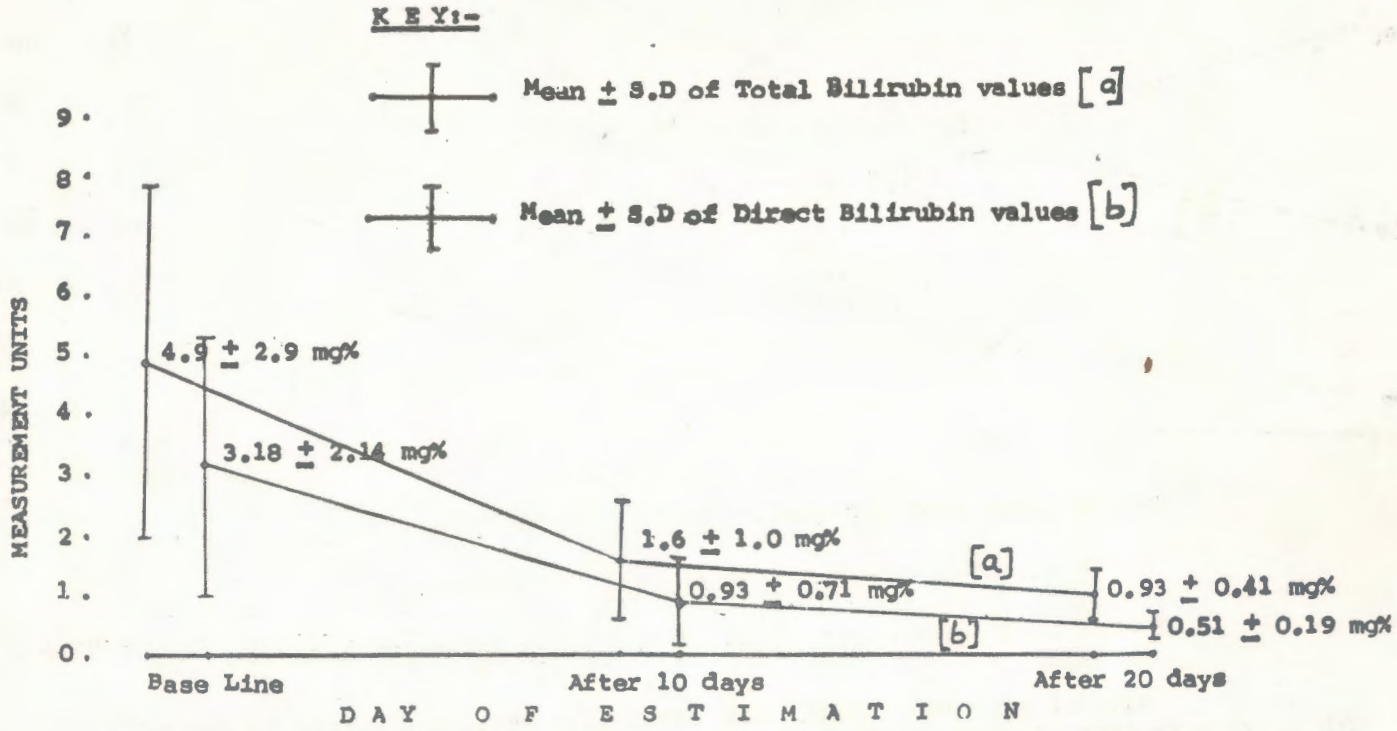
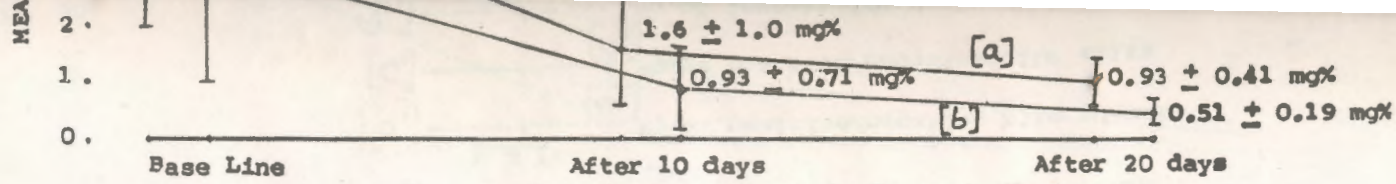


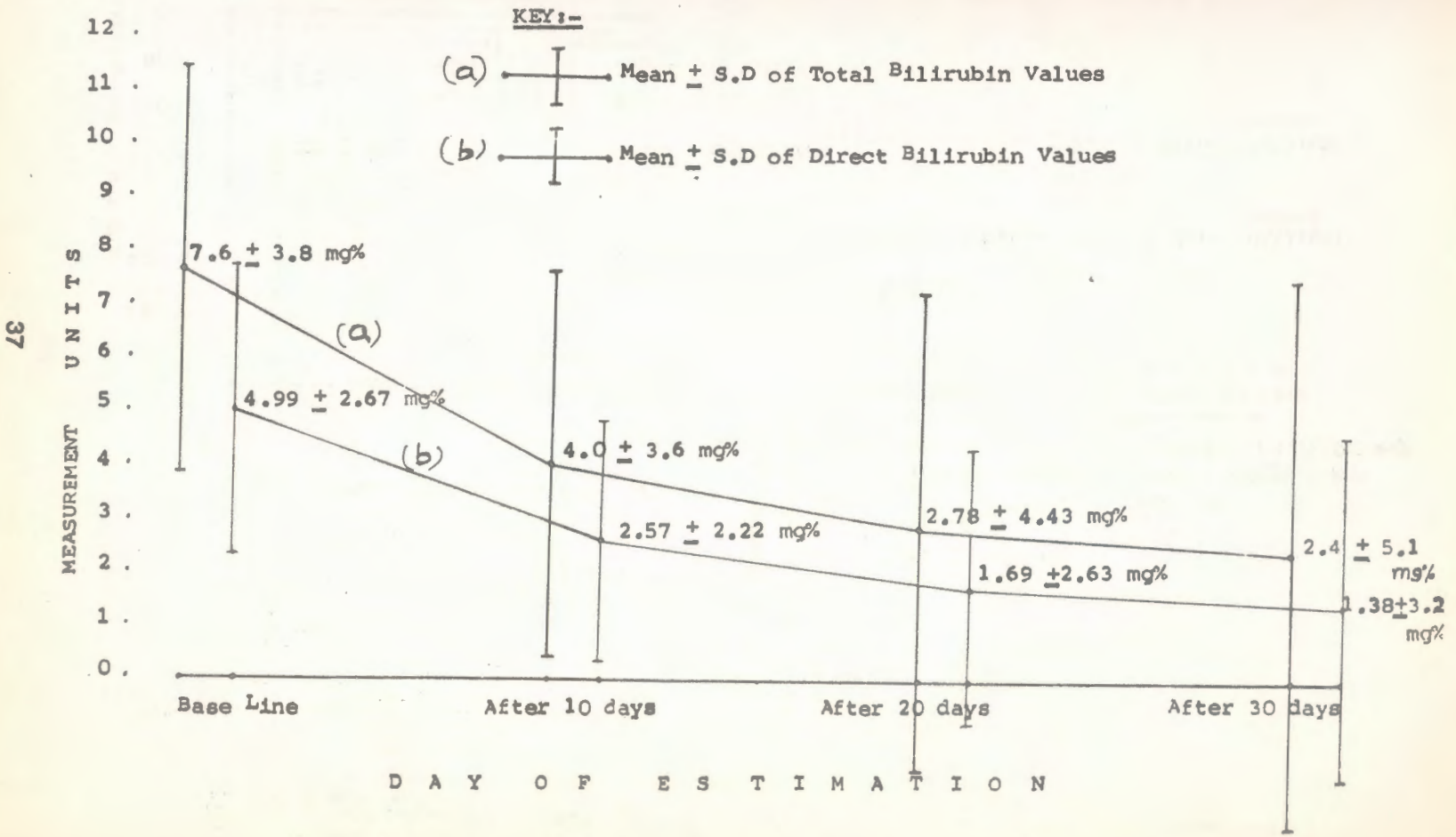
THE SERUM BILIRUBIN (TOTAL & DIRECT) LEVELS OF 'ILTEHAB-E-KABID HAD' (JAUNDICE) PATIENTS TREATED WITH CODED DRUG 'IKH4' (YN4) FOR 20 DAYS



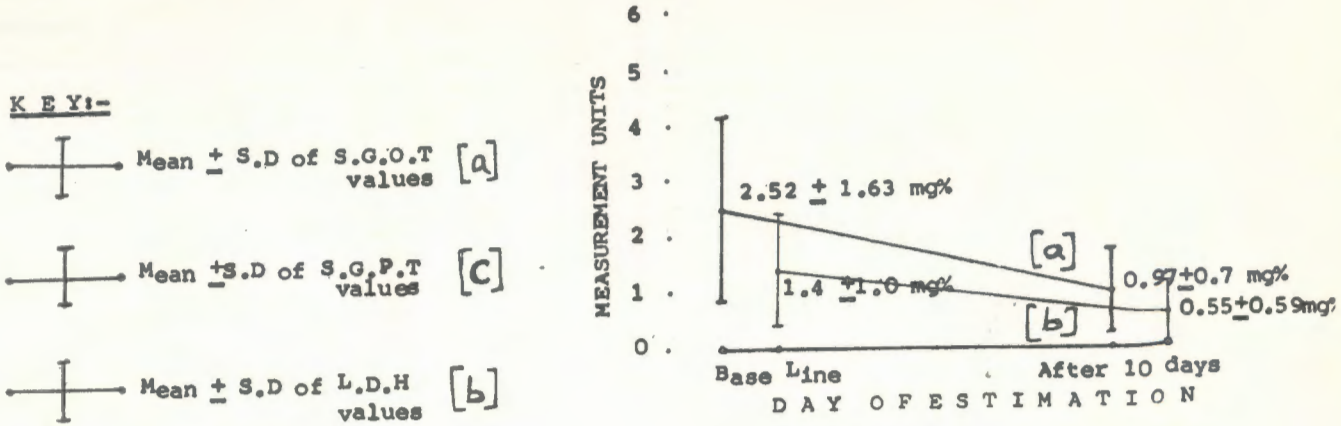
THE SERUM BILIRUBIN (TOTAL AND DIRECT) LEVELS OF 'ILTEHAB-E-KABID HAD' (JAUNDICE) PATIENTS TREATED WITH CODED DRUG 'IKH4' (YN4) FOR 30 DAYS

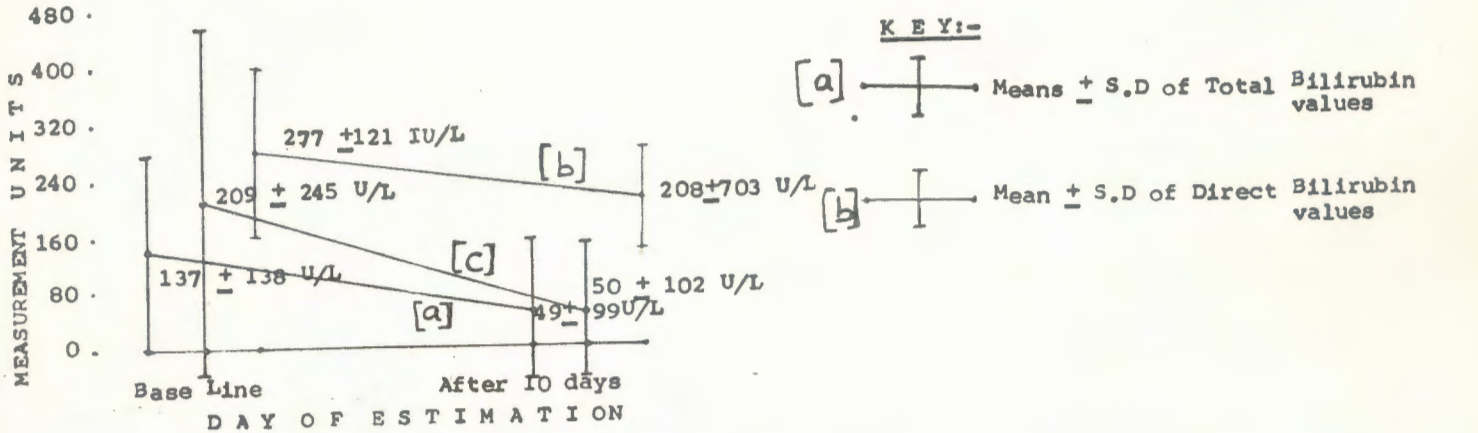


THE SERUM BILIRUBIN (TOTAL AND DIRECT) LEVELS OF 'ILTEHAB-E-KABID HAD' (JAUNDICE) PATIENTS TREATED WITH CODED DRUG 'IKH4' (YN4) FOR 30 DAYS



THE S.G.O.T, S.G.P.T, L.D.H AND SERUM BILIRUBIN (TOTAL & DIRECT) LEVELS OF 'ILTEHAB-E-KABID HAD' (JAUNDICE) PATIENTS TREATED WITH CODED DRUG 'IKH4'(YN4) FOR 10 DAYS

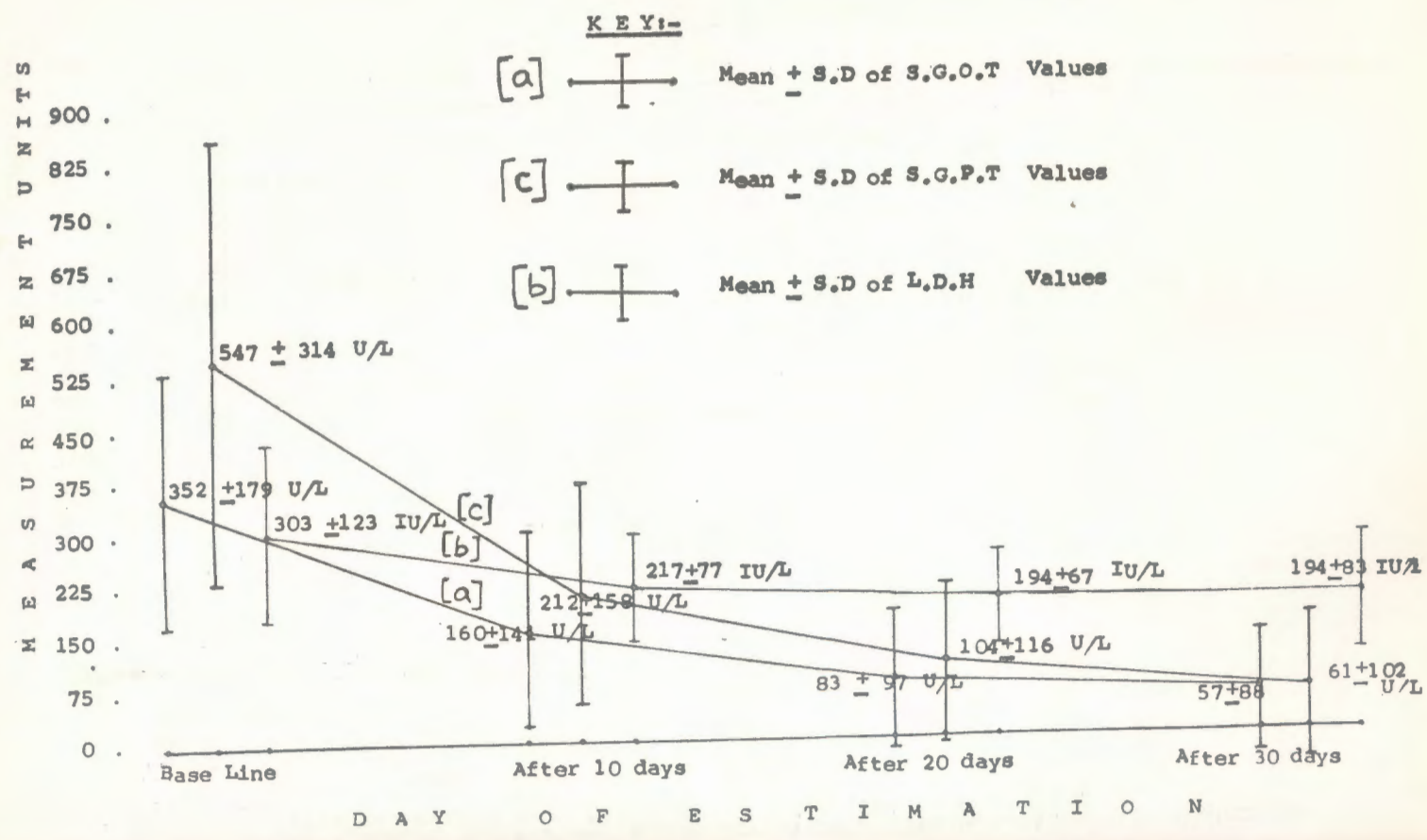




THE ALK. PHOSPHATASE AND THYMOL TURBIDITY LEVELS OF 'ILTEHAB-E-KABID HAD' (JAUNDICE) PATIENTS TREATED WITH CODED DRUG 'IKH4' (YN4) FOR 30 DAYS

THE S.G.O.T, S.G.P.T AND L.D.H LEVELS OF 'ILTEHAB-E-KABID HAD' (JAUNDICE) PATIENTS TREATED WITH CODED DRUG 'IKH4' (YN4) FOR 20 DAYS

THE S.G.O.T. , S.G.P.T AND L.D.H LEVELS OF 'ILTEHAB-E-KABID HAD' (JAUNDICE) PATIENTS TREATED WITH CODED DRUG IKH4 (YN4) FOR 30 DAYS



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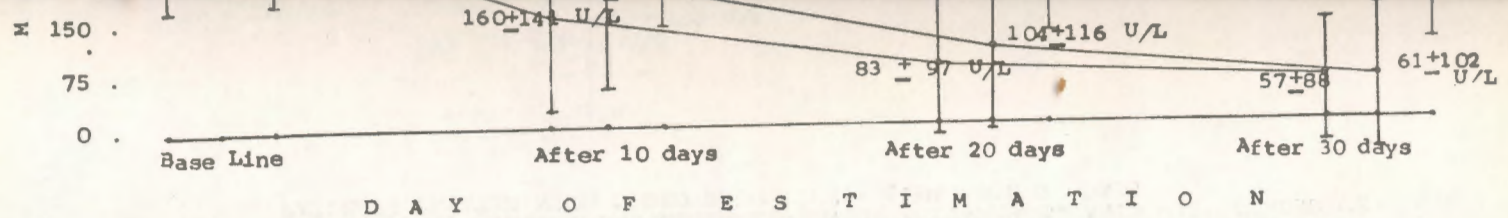

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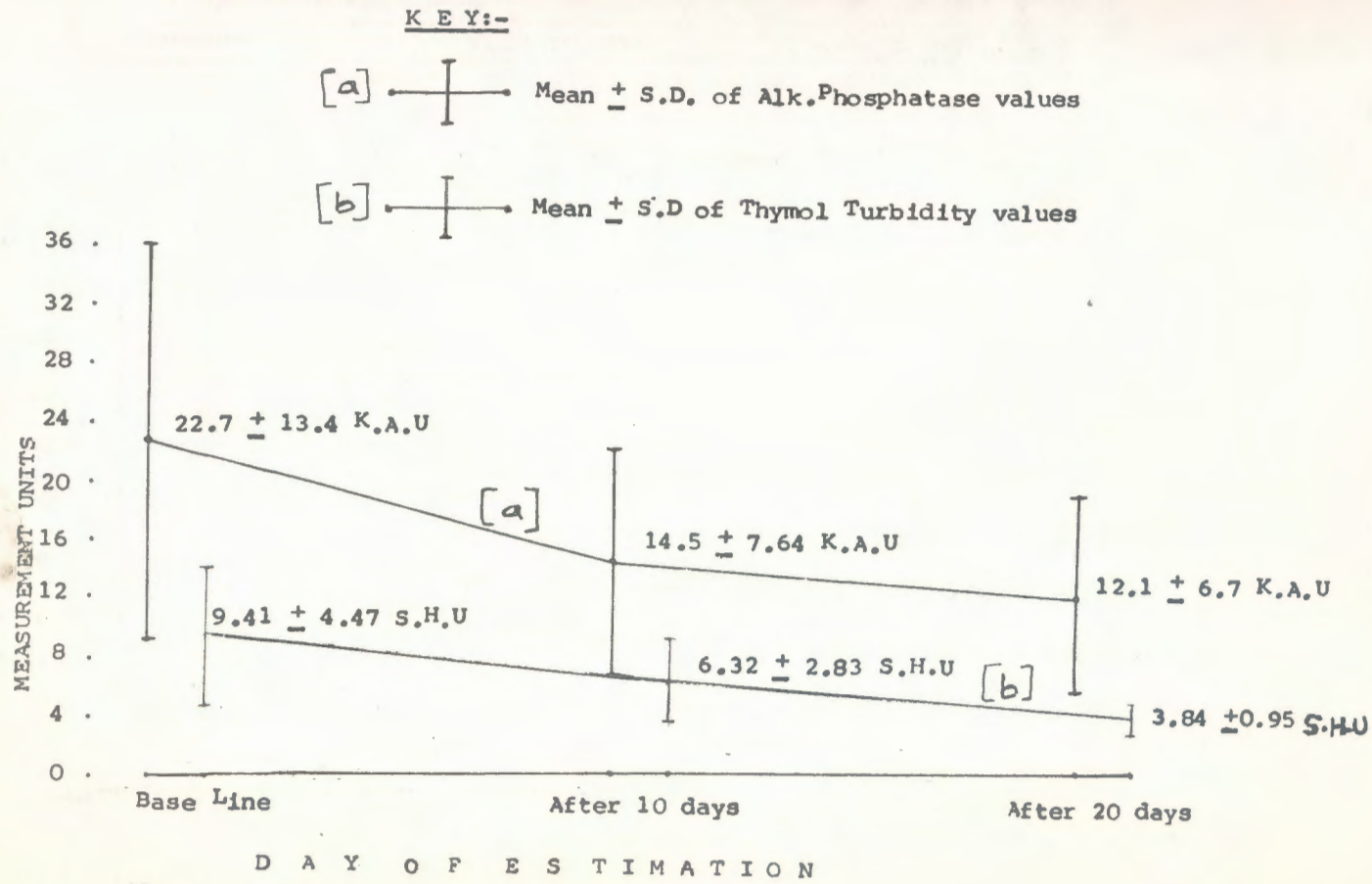

CONCLU

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DE-CODI

1. Code Na
2. Ingredien
3. Ratio of t
4. Method o
5. Dosage

CONCLUSION

It is concluded from the observations recorded in this study of 290 cases treated for 'ILTEHAB-E-KABID HAD' (Jaundice - Infective Hepatitis) that the Unani coded drug IKH_4 is effective clinically. Without any side effects or toxicity and the parameters both Pathological and Bio-chemical become normal within the stipulated period of time. Hence, it is concluded that this drug may be taken up at the multi-central trial level to prove its efficacy and utility.

DE-CODING OF THE FORMULA

1. Code Name	:	"IKH_4"
2. Ingredients	:	a) Tukhm-e-Kasni b) Honey c) Naushader
3. Ratio of the ingredients	:	1:3:0.01
4. Method of preparation	:	Heat the honey on stove till it attains the "Qimam" stage then add the powdered "Naushader" and allow it to cool. After getting cool add the "Tukhm-e-Kasni" powder and make it paste (Majoon)
5. Dosage	:	Adults : 10-15 gms (tds) before meal Children : 3-5 gms (tds) before meal

0. Base Line — After 10 days — After 20 days — After 30 days

DAY OF ESTIMATION

BOTANY

INTRODUCTION

Kasni (*Cichorium intybus* Linn.) belongs to the natural order Compositae or Asteraceae. Th Arabs refer to this as Hindyba or Shikoriah. It is a perennial herb, 1 to 3 feet high, with a fleshy ta root upto 2 1/2 feet in length.

GEOGRAPHICAL DISTRIBUTION :

It is a native of the temperate parts of the old world and is found wild in Punjab, North Wes Frontier Province and Hyderabad. Cichorium is a genus of 13 species of herbaceous plant distributed in Europe, the Mediterranean regions and Northern Asia.

VERNACULAR NAMES :-

Arabic	:	Hindubar, Indyba
Baluchistan	:	Zral
California	:	Chicory, Ragged Sailor, Succury, Wild Bachelor's Button
Catalan	:	Camaroja, Xicoina, Xicoira
Dutch	:	Bitterste Cichory, Cichory, Wild Chichory, Wild Succary
French	:	Barbe de capucin, Boisde Corde, Cheveuxde Pysan, Chicore amere, Chicoree Sauvage, Ecoubette, Herbe Cafe, Herb amere, Inthybe
German	:	Blausamenwirbel, Cichorie, Hindeg, Weglunge, Wegwart Wegueiss
Greek	:	Kischora, Kikori, Kikorion, Seris Pekris
Italian	:	Cicorea, Cicoria, Radieehio, Cicueira
Malta	:	Chicory, Cicoria, Radicchio, Cicueira
Persian	:	Kasani, Kasni
Polish	:	Godrognik
Portugese	:	Almeirao, Chicorea, Brava
Romanian	:	Cicoare
Russian	:	Taikorie
Bengali	:	Hinduba
Gujarati	:	Kasni
Hindi	:	Kasni
Tamil	:	Kashini - Virai
Telugu	:	Kasni - Vittulu
Urdu	:	Kasni

ompositae or Asteraceae. The
o 3 feet high, with a fleshy tap

nd wild in Punjab, North West
species of herbaceous plant
a.

ccury, Wild Bachelor's Button

Wild Chichory, Wild Succary
rde, Cheveuxde Pysan, Chicoree
Ecoubette, Herbe Cafe, Herb

Hindeg, Weglunge, Wegwarte

Seris Pekris
, Cicueira
, Cicueira

PLANT OF KASNI

VEGETATIVE AND IN REPRODUCTIVE STAGE

DESCRIPTION OF PLANT :

An erect usually rough and more or less glandular, perennial herb, juice milky, stem 0.3 - 0.9m, angled or grooved branches tough rigid, spreading. Radical and lower leaves 7.5 - 15 cm, pinnatified, lobes toothed, pointing downwards, upper leaves alternate, small, entire; flowering heads ligulate 2.5 - 3.8 cms. diam. terminal and solitary or axillary and clustered sessile or short, thick stalk, involucre of about 8 inner bracts and few outer smaller ones, all leaves like with concave bases, receptacle flat, usually bristly. Clowers, bright blue, papus of 1 or 2 series of short, blunt erect scales, lingules very long, spreading, 5 toothed, style arm long. Achenes smooth, angled, crowned with ring of papus scales.

The plant is of 2 varieties. One called sweet variety and the other is wild variety.

SWEET VARIETY :-

The plant is a good tonic with cooling principles, quenching thirst, useful against head-ache ophthalmia, throat inflammation, enlargement of spleen, fever, vomiting, fdiarrhoea. The root is the best part of the plant, a good stomachic and diuretic. It enriches and purifies the blood, lessens inflammation and pain in the joints. The leaves are applied topically to reduce pain in the joints.

The seeds are given as brain tonic alexiteric, appetiser, good in headache, opthalmia biliousness, lumbago, troubles of the spleen, asthma.

WILD VARIETY :

The plant is a tonic, emmenagogue, alexiteric, astringent to the bowels, cures asthma biliousness, inflammation, enriches blood (Khoon), the root has tonic dimulcent and cooling properties. Seed are considered carminative and cardiac stimulant.

CULTIVATION:

The plant has been cultivated in Nadiad, Broach and Amalsad in Maharashtra State. It is grown either as fodder or for roots which from an article of commerce.

The plant appears to grow on any type of soil. Sandy loam is however considered to be best provided that there is adequate, evenly distributed rainfall or irrigation is possible. The growing season lasts for six months.

To obtain the root crop the practice in New Zealand is to sow the seeds in mid October on ridges 22" apart. 2 - 2 1/2 lbs of seeds are required per acre of land. It is essential to eliminate the weeds completely during the early period of growth. (Richards, N.Z.J.Agr.1944, 69, 581). The roots are lifted, as soon as they are ripe, with a special type of plough and left in the field for 14 days. If delayed they become fibrous and loose weight.

Average yield in New Zealand is 10 - 11 tons per acre while in India it is considerably lower

PHARMACOGNOSY

Parts used:

Fruits, roots flowers and leaves (Kirtikar and Basu 21, Anonymous 17).

Procedure and time of collection :

When the plants are mature, usually at the end of May, they are harvested, dried under shade or kiln dried, smashed, winnowed and fruits collected.

Preservation and storage :

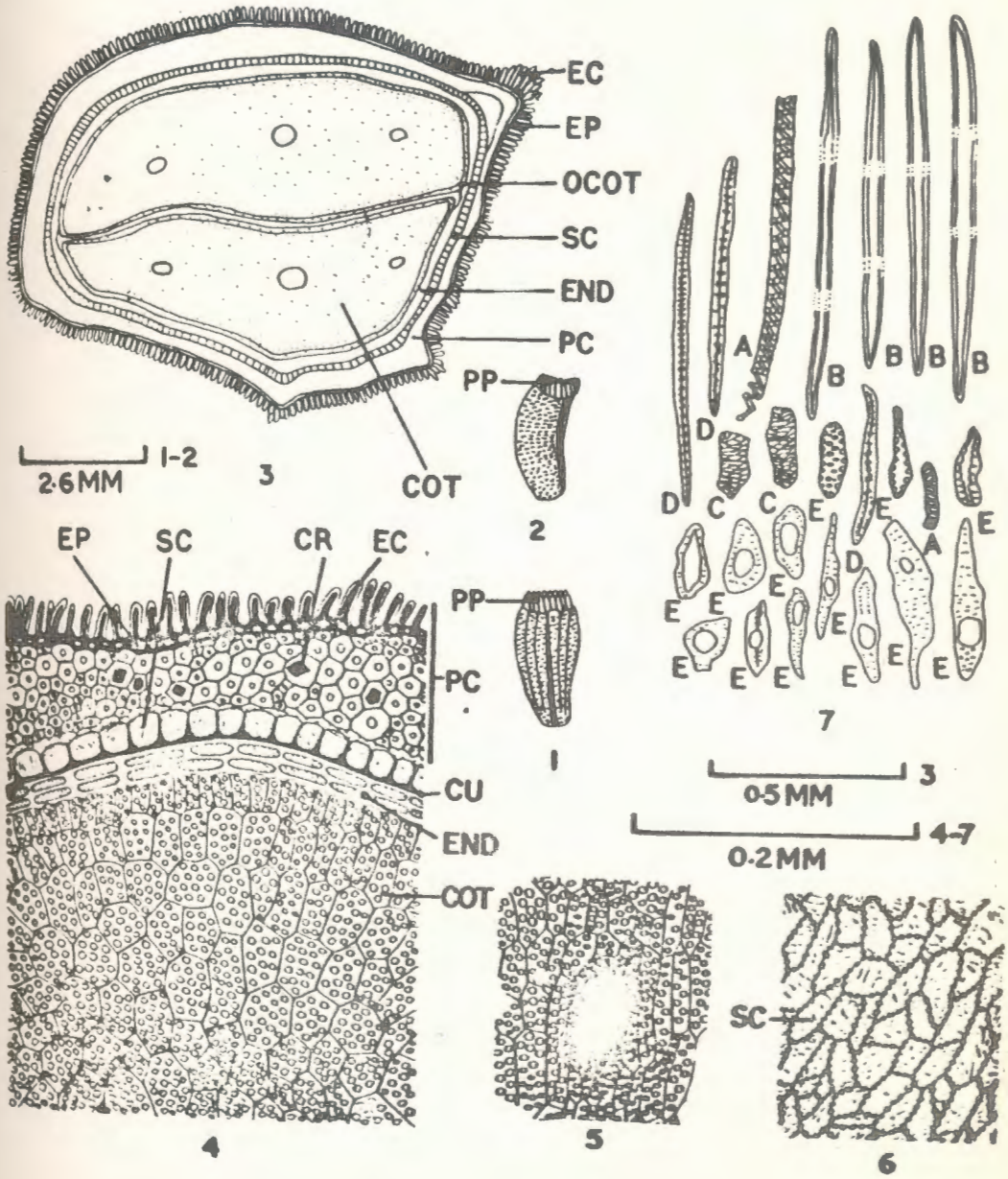
The dried fruits may be stored in moisture free air tight containers. Certain preservatives in the form of tablets may also be used to store the seeds for longer period without disturbing the chemical constituents of the drug.

Morphology

a) Macroscopic: Fruits small dry, indehiscent about 3 mm long and 2mm broad, angled, crowned with a ring of white or straw coloured about 0.5 mm long or even smaller pappus; pappus sometimes half white and half straw coloured. Mature fruits when seen with naked eyes are brownish to black as well as mottled, whereas those which are less matured are light yellow. Seeds about 2.5 mm long ovoid, apex pointed, tip brownish. Cotyledons plano convex, white. The average weight of 100 fruits is approximately 0.2077 g (this is an average of three observations).

b) Microscopic : (Plate 2 figs 1-7): In transection of the mature fruit the pericarp consists of outer single layered, targentially elongated epidermis surrounded all around by thick cuticle (Fig.4). Numerous red-shaped epicuticular wax deposits of different sizes emrge out from the cuticle. These rods are often nearly perpendicular to the surface of the epidermis fig.4. Epidermis is followed by about 6-10 layered sclerenchymatous cells in the area where the fruit wall slightly projects out to form pericarp ribs: in rest of the area it is about 4-6 layered. Most of the sclerenchymatous cells contain prismatic crystals of calcium oxalate. The inner epidermis of the pericarp is single layered and slightly thick walled. It usually gets disintegrated during sectioning. The seed coat is single layered, radially elongated having perquatry arrangement of cells (Figs 4 and 6). There is a thick deposition of cuticle on the lower wall of the seed coat. This layer is followed by 2 layered tagentially elongated cells of endosperm filled with cellur contents. The endosperm is followed by multilayered polygonal cotyledons cells which are filled with almost globular cell contents and oil gloubles. At certain places in cotyledone there occur almost circular islands of comparatively smaller cotyledonary cells (Fig.5). The vascular bundles are not identifiable. The macerates consist of different sizes of stone cells, macrosclereids, fibres, testal cells with perquatry arrangement of cells, xylem vessels and xylam parenchyma. The measurement of different cells and tissues are give in Table I.

PLATE 2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END
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4
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A
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E
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0·5MM
3
0·2MM
4-7

PLATE 2 (FIGS. 1 TO 7)

Fig 1 Fruit of Kasni dorsal view (Diagrammatic)

Fig 2 (Fruit of Kasni ventral view (Diagrmmatic)

Fig 3 Cross-Section of fruit (Diagrammatic)

Fig 4 Cellular details of a Section of (Fig.3)

Fig 5 Cellular details of a portion of cotyledon

Fig 6 Surface view of testa

Fig 7 Different types of macerates

A : Helical Vessel

B : Fibres

C : Testal Cells

D : Brachyscelereids

E : Stone Cells

Abbreviation:

COT : Cotyledons; CR: Prismatic crystals of Calcium Oxalate; Cu:Cuticle; EC: Redshaped epicuticular wax deposits; END: Endosperm; EP: Epidermis; OCOT : Outermost layer of Cotyledonary cells: PC: Pericarp; PP:Pappus; SC: Seed-coat

TABLE - I

The measurement of cells and tissues in microns.

Cells & Tissues	Measurements in microns
Epicuticular red shapped wax deposit	97.57 x 8.34-44.55 x 8.34-29.19 x 8.34
Sclerenchyma	20.85-16.68-8.34 in diameter
Seedcoat in T.S.	20.85x16.68-25.02x25.02-33.36 x 20.85
Seedcoat in surface view	83.40 x 29.19-75.06x25.02-62.55 x33.36
Endosperm	41.70 x 8.34-25.02x12.51-20.85x 8.34
Cotyledonary epidermis	20.85-33.36 diameter, 54.21x37.53-45.87x33.36
Macerates	
Stone cells	50.04x20.85-41.70x16.68-33.36x38.36
Macrosclereids	208.50x12.51-145.95x8.34-125.10x8.34
Seed coat	85.06x12.51-72.55x12.51-45.87x20.85
Xylem vessels	333.60x20.85-208.50x20.85-125.10x20.85
Fibres	500.10x8.24-416.75x8.34-229.35x8.34
Tracheids	149.85x834-137.61x12.51-75.06x8.34
Prismatic crystal	12.00x10.00-15.00x10.00-10.30x11.60

CHEMISTY OF TUKHM-E.KASNI

The seeds are reported to contain (Nadakarni, 1954 [13]) a bland of oil. Burnt chicory contains sugar free extra-active cellulose, nitrogenous matter and fat. The quantitative estimation of fats, tannine, sugars, alcohol and water soluble extractives, crude fibres, swelling faster etc. were carried out and the result incorporated in table - 2 below :

TABLE - 2

(i)	Tannins	2.677%
	Reducing sugars	in traces
	Non reducing sugars	in traces
	Alcohol soluble extractive (IP Method)3	6.164%
	Water soluble	2.340%
	extractive (IP Method) 3	2.340%
	Crude fibre	30.65%
	Swelling factor	Nil
	Fat	23.142%
	Saponification value	143.19
	Iodine value	138.59
	Loss on drying at 120° C	7.88%

ii) Successive extraction & qualitative tests of extracts for the presence of compounds

The drug was soxhleted successively in different organic solvents and the extracts were subjected to qualitative tests. The result is recorded in the table-3.

Extractive values and physico chemical tests.

	Pet.ether (60-80)	Benzene	Chloro-form	Alcohol	Aqueous
Total % by weight	23.142	0.28	0.534	12.074	8.77
Physical appearance and consist-tency	Yellow oily	Yellow with light green tinge non-sticky	Brown non-sticky	Dark brown, non-sticky	Dark brown, non-sticky
Steroids	+	+	+	-	-
Triterpenoids	-	-	-	-	-
Alkoloids	-	-	-	+	+
Flavonoids	-	-	-	+	+
Tannins	-	-	-	+	+
Reducing sugars	-	-	-	+	+
Polysacc-harides/ glycosides	-	-	-	-	-
Saponins	-	-	-	-	+

iii) Thin laye

The TLC
plates co
Benzene
Both petr
0.150, 0.2
(Plate 3).

HISTOCHEMICAL

The free hand s
ferric chloride solution
mounted sections the
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where as in case of 5%
and testal cells light ye
hand section were als
reaction with this reag

STUDY OF POWD

The powder is
treated with water it dev
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was cleared in chloral h
macrosclereids, fibres
crystals in the form of
in the Table - 4.

TABLE - 4

Chemical colour

S.No.	Chemical
1.	Powder tr
2.	Powder tr
3.	Powder tr
4.	Powder tr
5.	Powder tr
6.	Powder tr with greer

iii) Thin layer chromatography

The TLC of the Petroleum ether extract and benzene extract was carried out on TLC plates coated with sillica gel using solvent system Pet. ether and benzene (1:1) and Benzene: Chloroform (1:1) respectively. The plates were developed by 2% H_2SO_4. Both petroleum ether and benzene extracts showed 6 spots with Rf values, 0.070, 0.150, 0.207, 0.330, 0.490, 0.980, 0.040, 0.150, 0.230, 0.350, 0.430, 0980 respectively (Plate 3).

HISTOCHEMICAL TESTS

The free hand sections, slightly thicker were mounted in 5% aqueous iodine solution and 5% ferric chloride solution and change of colour in different tissue were noted down. In case of iodine mounted sections the outer epidermal layer of the pericarp together with epicuticular wax deposit turns in bluish black colour, the mesocarp into orange colour and rest of the tissue in yellow colour. Where as in case of 5% ferric chloride mounted material, the epicarp becomes blackish, mesocarp and testal cells light yellow, cuticular layer light brown and rest of the tissue light greyish. The free hand section were also treated with Sudan IV (Sudan III). The cotyledonary cells give positive reaction with this reagent showing the presence of fats in the cotyledons.

STUDY OF POWDERED DRUG

The powder is yellowish grey in colour almost tasteless without any definite smell, when treated with water it develop light grey colour with white tinge. When the powder is pressed between folds of a piece of paper it leaves oilish stains on the paper. The powder sieved with muslin cloth was cleared in chloral hydrate solution (aqueous) and mounted in glycerin. It consists of stone cells, macrosclereids, fibres, xylem vessels with spiral thickening, cotyledonary cells. Calcium oxalate crystals in the form of prisms. The powder was chemically treated and colour reaction was noted in the Table - 4.

TABLE - 4

Chemical colour reaction of the powder.

S.No.	Chemical treatments	Colour reaction
1.	Powder treated with Conc. H_2SO_4	Pink
2.	Powder treated with saturated picric	Yellow
3.	Powder treated with glacial acetic acid	Dull yellow
4.	Powder treated with 5% iodine solution	Brown
5.	Powder treated with 5% ferric chloride sol.	Greenish
6.	Powder treated with a few drops of NH_4OH with greenish tinge	Yellow

PLATE 3

TUKHM-E-KASNI

PETROLEUM ETHER EXT.	BENZENE EXTRACT
Solvent System Pet. Eth. : Benz. 1 : 1	Solvent System Benz : Chloro 1 : 1
DETECTING REAGENT $2\% H_2SO_4$	
Rf = 0.98 Brown	Rf = 0.98 Dark Brown
Rf = 0.49 Light Brown	Rf = 0.43 Light Brown
Rf = 0.33 Light Brown	Rf = 0.35 Light Brown
Rf = 0.207 Light Brown	Rf = 0.23 Light Brown
Rf = 0.15 Light Brown	Rf = 0.15 Light Brown
Rf = 0.07 Brown	Rf = 0.04 Light Brown
O	O

CHROMATOGRAM

7.	Powder treated with Selivanoff's reagent + alcohol	Light brown
8.	Powder treated with Millon's reagent	Light brown
9.	Powder treated with 10% NaOH followed by a drop of copper sulfate solution	Greenish brown
10.	Powder treated Selivanoff's reagent	Light brown
11.	Powder treated with 40% NaOH + a drop of 5% lead acetate	Yellow
12.	Powder treated with acetic acid + Conc. H_2SO_4	Dark brown
13.	Powder treated with Conc. HNO_3 + excess of Ammonia	Brownish yellow with reddish tinge
14.	Powder treated with acetic acid + a trace of ferric chloride and transferred to the surface of Conc. H_2SO_4	Dark brown

FLUORESCENCE ANALYSIS OF THE POWDERED DRUG

The powdered drug was treated chemically and exposed to U.V. light in accordance with the methods described by Kokshi et al (1958[22]). The fluorescence observed was recorded in table 5 below.

TABLE -5

FLUORESCENCE ANALYSIS OF THE POWDERED DRUG.

S.No.	Chemical treatment	Colour in dry light	Fluorescence under U.V.light
1.	Drug mounted in nitrocellulose in amyl acetate	Light grey	Dark green
2.	Drug mounted in I N Sod.hydroxide in methanol	Yellow	Dark brown
3.	Drug treated with I N NaoH in dried and mounted in nitro-cellulose in amyl acetate	Reddish brown	Dark brown
4.	Drug treated with 1 N HCl	Light yellow with reddish tinge	Dark green

5.	Drug treated with 1 N HCl dried and mounted in nitro-cellulose in amyl acetate	Light brown with white tinge	Dark green
6.	Drug treated with 1 N NaOH in water	Yellowish brown	Blackish
7.	Drug treated with 1 N NaoH in H_2O, dried and mounted in nitrocellulose in amyl acetate	Brown	Greenish black
8.	Drug treated with Nitric acid diluted with an equal vol. of water	Yellowish red	Blackish
9.	Drug treated with sulphuric acid diluted with an equal vol. of water	Dull brown	Dark greenish brown
9.	Drug treated with sulphuric acid diluted with an equal vol.of water	Dull brown	Dark greenish brown
10.	Drug powder as such (Control)	Dull yellow	Green

IDENTITY, PURITY, STRENGTHENED ASSAY

a)	Foreign organic matter	12.884%
b)	Total ash	8.74%
	Acid in soluble ash	0.98%
	Water soluble ash	0.69%
	Taste	Almost tasteless
	Temperament	Sard² Khushk²
	Action	Diuretic, antipyretic (Kirtikar & Basu 21 (1933) Anonymous 17 (1950)
	Substitutes	Tukhm-e-Kasoos; Tukhm-e-Khurfa, Tukhm-e-Shahstra
	Important formulation	Sharbat Kasni, Arq Harabhara

Therapeutic uses	Used in dropsy, inflammation of liver, jaundice, fever and other bilious complaints
Dose	7g to 17.5g
Correctives	Sikanjbean, Aneesoon and Kateera 7 & 8
Controversy	There is another species of Cichorium i.e. C.endivia L. which is a cultivated variety This species is also known as Kasni. It is supposed to be cultivated from C.intybus L.

CHEMISTRY OF NAUSHADAR (AMMONIUM CHLORIDE)

It is a chemical compound derived from Ammonia. Its molecular formula is NH_4Cl, and its molecular weight is 53.2

METHOD OF PREPARATION OF AMMONIUM CHLORIDE :

i) It is manufactured by boiling ammonium sulfate with sodium chloride,

$$(NH4)_2SO_4 + 2NaCl \longrightarrow 2NH_4Cl + Na_2SO_4$$

ii) It is formed when Ammonia and hydrogen chloride are allowed to come into contact,

$$NH_3 + HCl \rightleftharpoons NH_4Cl$$

PROPERTIES OF AMMONIUM CHLORIDE :

1. It is soluble in water making it a suitable electrolyte for, certain kinds of electric primary cell.
2. Ammonium chloride vaporizes at approximately 337° C, and the density of vapour at 400° C is found to be only 50% of water.
3. Hence the vapour density = 53.2 /2 = 26.75

   53.2 = molecular weight of Ammonium chloride.
4. Pharmaceutical grade should be pure and free from Arsenic, Barium, Iron, Lead and sulfate

USES AND APPLICATION :

Ammonium Chloride - As Urinary acidifier

Ammonium Chloride is an acidifying salt which temporarily reduces urinary pH. Tolerance develops within two to three days. Ammonium chloride is used in conjuction with the urinary antiseptic, methenamine. It also can be used to acidify urine in order to impede renal tubular reabsorption of organic bases and thus enhance their urinary excretion when such bases are the

causes of poisoning. Ammonium chloride should not be used as a diuretic for forced diuresis to hasten excretion of poisons. Adequte dose of Ammonium chloride frequently causes gastric irritation, nausea and even vomiting.

CHEMISTRY OF HONEY

DESCRIPTION :

Honey is a viscid, translucent, nearly white to pale yellowish or yellowish-brown fluid. It becomes partially crystalline, and semi-solid on keeping, owing to the separation of dextrose as crystals. It has an agreeable characteristic odour and sweet taste, the odour and taste depending upon the nature of the flowers from which the nectar was collected. The specific rotation of honey is from $+3^0$ - 10^0

Honey obtained from heather and clover is considered to have the finest flavour, while that from species of Eucalyptus is the least agreeable. Ling honey is thixo-tropic.

Constituents :- Honey is essentially a solution of levulose (40-50%), dextrose (32-37%), and sucrose (c.2%) in water (13-20%), the proportion of the sugars vary with the floral source and also on the activity of invertase normally present in honey. The minor constituents of honey are : dextrins, maltose and gums (1-12%); mineral constituents (ash 0.25%); enzymes (invertase, diastase, insulace, etc.); traces of proteins and vitamins (B group and C) amino acids, free acids (Mostly malic and citric and traces of succirin, acetic and formic), suspended solids (Pollen grans and beeswax), colouring matter (xanthophyll, carotene and chlorophyll derivatives depending on the floral source), and traces of other materials, which vary according to the source of the nectar.

Partially granulated honey ferments more easily than liquid honey. This is because the dextrose crystals formed are in the form of dextrose hydrate containing only 9.09% moisture, this releases moisture to the rest of the honey, which thereby becomes diluted and more susceptible to fermentation.

Uses :-

Honey is largely used as a demulcent and sweetening agent as well as for its nutritive properties. Many cough medicines and laxative contains honey.

CHEMISTRY OF COMPOUND ELEMENTS PRESENT IN IKH-4

NAME OF THE DRUG : IKH-4 (CODED DRUG)

S.No.	Parameters analysed		Results
1.	Appearance	:	Semi solid
2.	Colour	:	Dark brown
3.	Smell	:	Characteristics of its own
4.	Taste	:	Sweet
5.	Alcohol soluble matter	:	31.64% W/W
6.	Water soluble matter	:	55.44% W/W, 55.62% W/W
7.	Successive extractive	:	
	a. Petroleum ether (60-80^0)	:	6.111% W/W, 6.58% W/W
	b. Chloroform	:	0.46% W/W, 0.48% W/W
	c. Ethyl alcohol	:	1.49% W/W
8.	pH of 1% solution	:	4.60
	pH of 10% solution	:	4.50
9.	Bulk density at 28^0 C	:	1.4334
10.	Solid content	:	20.34% W/W, 20.78% W/W
11.	a. Ash value	:	1.72% W/W, 1.79% W/W
	b. Water soluble ash	:	0.58% W/W, 0.60% W/W
	c. Acid insoluble ash	:	0.11% W/W, 0.12% W/W
12.	Volatile oil	:	Nil
13.	a. Total fat	:	6.11% W/W, 6.58% W/W
	b. Saponification value	:	207.76, 209.82
	c. Iodine value	:	130.17, 131.66
14.	Acid value	:	59.68, 60.29

15. Qualitative tests :

a. Phenolics	:	Positive
b. Alkaloids	:	Positive
c. Steroids & Terpenoids	:	Positive

16. Quantitative estimation of :

a. Phosphate	:	0.064mg/100g.
b. Alkaloids	:	0.08% W/W, 0.09% W/W
c. Total Nitrogen	:	0.093% W/W
d. Tannins	:	1.08% W/W, 1.23% W/W
e. Resins	:	6.13% W/W, 6.31% W/W
f. Reducing sugar	:	49.90% W/W
g. Non-reducing sugar	:	12.68% W/W, 13.20% W/W
h. Crude fibre	:	4.69% W/W, 5.13% W/W

17. T.L.C. analysis

S.No.	Extracts	Solvent systems	Spraying reagent	Rf value
1.	Petroleum ether. (60-80)	Petroleum ether ethyl acetate 24:1	5% conc. sulphuric acid in ethyl alcohol	0.96 0.79 0.54 0.47 0.27 0.12 0.07
2.	Chloroform	Benzene : Chloroform: ethyl alcohol 2:4:1	Iodine chamber	0.96 0.18
3.	Ethyl alcohol	Amyl alcohol:Acetic acid : water.	0.1% neutral ferric chloride solution in ethyl alcohol	0.89 0.71 0.54 0.31

CONSOLIDATED REPORT ON THE ELEMENTS PRESENT IN THE DRUG IKH-4 (CODED DRUG)

1.	Qualitative tests (Metals & Toxic elements)	:	
	a. Iron	:	Positive
	b. Arsenic	:	Positive
	c. Molybdenum	:	Positive
	d. Tin	:	Negative
	e. Lead	:	Negative
	f. Antimony	:	Negative
	g. Chromium	:	Negative
2.	Quantitative estimation of :		
	a. Arsenic	:	0.015%
	b. Molybdenum	:	0.0027%

PHARMACOLOGY

The drug, was studied for its liver regenerative activity in groups of partially hepatectomised wistar albino rats. The study revealed that it showed significant increase in rate of liver regeneration. The mitotic index of the regenerating liver of the drug treated animals were significant compared to untreated controls.

THERAPEUTIC USES :

The plant is therapeutically indicated in fevers, vomiting, dropsy, diarrhoea and in the enlargement of the spleen (Bhatnagar[2]). It increases the bile secretion, promotes digestion and used as an appetizer, stomachic, tonic and diuretic. The decoction of the seeds or powdered seeds are claimed to be useful in disordered menstruation and obstruction of the liver. The seeds contain a bland oil (Nadkarni [5]) The seeds are recommended in liver diseases (Abu-Ali-Ibn-Sina[1]) ascites, splenic disorders and liver diseases (Mohamed Azam Khan[9]). In addition a number of authors of Unani medicine have mentioned its efficacy in liver diseases (Raza Ali Khan[8], Kabiruddin[11], Najamul Ghani[19]).

The liver is one of the important organ in the body for metabolism, immunity, circulation, respiration, reproduction and digestion. Thus the liver possesses a number of physiological functions. The adult mammalian liver has a remarkable capacity for growth by compensatory

hypertrophy and hyperplasia, after the loss of functional hepatic tissue. In case of rats, when 20 to 75% of the liver is removed, the remaining part regenerates completely within 6 to 8 weeks. The present study communicates the experimental investigation conducted on partially hepatoctomised rats to evaluate the hepatic regeneration or restoration by an Unani Research Drug (CI).

MATERIALS & METHODS

Botanically identified seeds of C.I. were collected, dried, powdered and an aqueous extract was prepared by keeping the powder (2 gms) in boiled distilled water (25 ml) and the supernatant was decanted after 16 hrs. and used for the experiment.

This was studied in wistar Albino rats (5 in each) ranging from 100 to 150 gms and divided into 10 groups of 5 animals each (Group I to X). Group I to V served as control and VI to X served as test groups. Partial hepatectomy was done in all groups of animals according to the method of Brues et al[9]. The animals were anesthetized with ether. The manubrium sterni was taken as the anatomical landmark. The classical incision is a vertical one but in our studies horizontal skin opening was done for about 1 or 1 1/2 cms. The muscle layer was visualised and incision was made 2 mm below the manubrium sterni towards the right hypochondrium. The liver was visualised with a surgical gauz soaked in warm saline and the liver was gently held and brought into view. With the assistant holding the liver, a tight knot was applied by using a black silk thread. The portion immediately above the knot was excised with a sharp scissors. The knot was trimmed and the remaining liver tissue was allowed to slide back. The muscle layer was repaired by individuals sutures taking care to obtain optimum opposition. If the sutures are applied very tightly the healing process may be affected. The thin layers were closed by an individual sutures. The drug C.I. was administered to test groups at a dose level of 2 ml/150 gm body wt. and distilled water 2 ml/100g. was given to control animals. The animals were sacrificed after 2nd day, 3rd day, 5th day, 7th day and 12th day and the livers were removed, dried between two filter papers and weighed. The liver body weighing index was calculated and the effects on treated and untreated animals were compared as reported by Lalitha Kameswaran and Nazimuddin[10]. A base line for wet and dry liver weights were established in a control series of animals sacrificed in the laboratory.

HISTOLOGICAL STUDIES AND MITOTIC INDEX

The liver specimens removed from the control and CI treated animals were processed serially with formalin, alcohol, xylene, wax and paraffin blocks were prepared. Sections about 10 microns in thickness were cut in a rotary microtome stained with haemotoxylin and eosin and examined under a magnification of 10 X and the mitotic index was calculated.

RESULTS

EFFECTS ON LIV

Body weight:

proportionate to the
animals and partially h
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regeneration of liver i
which have been foun
difference in the perc
end of 12 days to 163
rate as evidenced by t
in all except 2 days t

CONTROL GRO

Days	Body wt.	Exp liv
2	120	4
3	125	4
5	150	5
7	150	5
12	160	

MITOTIC INDE

The Table
operated CI treate
and the average
liver from the test
as evidenced by
results are show

RESULTS

EFFECTS ON LIVER REGENERATION:

Body weight: **Liver weight:** The Table I shows the percentage of liver weight proportionate to the body weight of the unreported animals, partially hepatectomised control animals and partially hepatectomised CI treated animals. It can be seen from the Table I that the liver regeneration in CI treated animals was much more higher than the control and significant. While the regeneration of liver in the control animals were 117.2% after 2 days, after partial hepatectomy and only 163.2% after 12 days. In CI treated group of animals the percentage of regeneration of liver in the 2 days study and 12th day study, was 122.1% and 221.9% respectively which have been found to be significant ($P<0.01$). The control group of animals showed a maximum difference in the percentage of regeneration (171-2%) at the end of 7 days, followed by a fall, at the end of 12 days to 163.2%, whereas the test groups animals exhibited a greater and faster growth rate as evidenced by the results (Table I). The difference in regeneration was statistically significant in all except 2 days treated groups.

TABLE I

LIVER REGENERATION OF C I

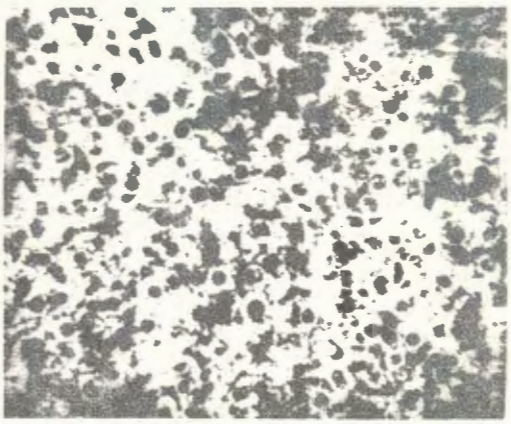
	CONTROL GROUP				C.I. TREATED GROUP			
Days	Body wt.	Expected liver wt.	Actual liver wt.	Liver Reg.%	Body wt.	Expected liver wt.	Actual liver wt.	Liver Reg.%
2	120	4.52	5.29	117.2	118	4.46	5.44	122.1
3	125	4.67	5.99	128.4	130	4.82	7.21	149.7
5	150	5.42	7.59	140.4	155	5.57	10.07	180.8
7	150	5.42	9.27	171.2	150	5.42	11.93	220.2
12	160	5.72	9.33	163.2	140	5.12	11.36	221.9

MITOTIC INDEX:

The Table II shows the difference in mitotic index of the operated control animal and the operated CI treated animals. The number of cells under mitosis in 5 fields (HP) have been observed and the average of the control group and treated group have been campared. The sections of the liver from the test group animals revealed a higher rate of mitosis, then the control group animals, as evidenced by a higher mitotic index in all the sub-groups starting from 2 days to 12 days. The results are shown in Table II. In the control group animals, the mitotic index was 2.12 at the end

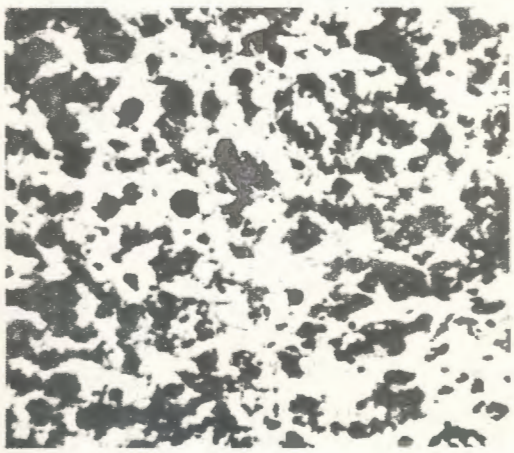
of 2 days which reached a maximum of 2.98 at 5 days and thereafter declined to 1.92 at 12 days. In the test group animals, the mitotic index at the end of 2 days was 2.74 and reached a maximum of 3.51 at the end of 5 days and thereafter declined to 3.40 at 7 days and finally to 2.89 at 12 days. However all the values were still higher than the corresponding control Values in all groups. At the end of 3 days both the control and test group animals exhibited a "lag phase". The mitotic index at the end of 2 days was 2.12 in the control group and 2.74 in the test group. The mitotic index at the end of 3 days was 2.01, in the control animals and 2.70 in the test animals.

SECOND DAY CONTROL / TEST



2 day control

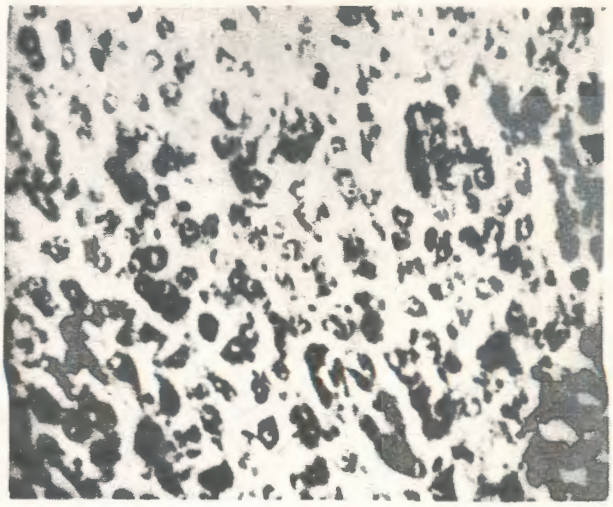
Section of the liver showing cloudy swelling of the hepatocytes and dropping out of certain cells especially in the centrizonal area



2nd day test

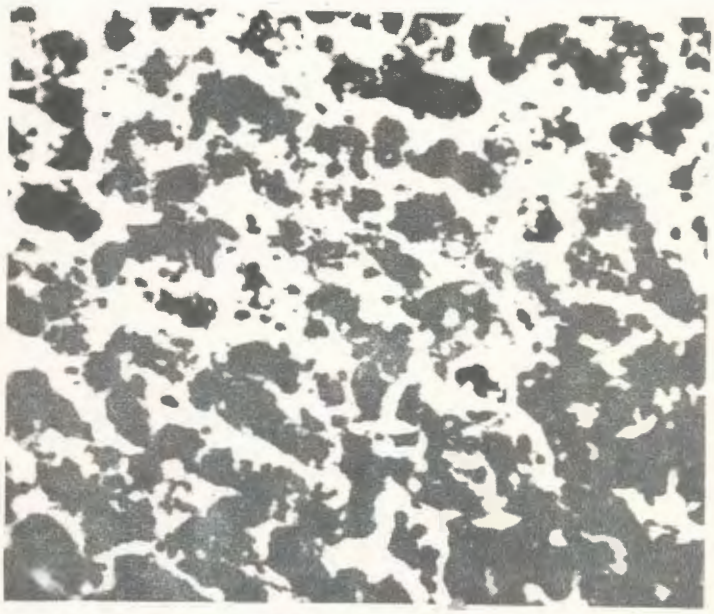
Section of the liver showing I cloudy swelling of some hepatocytes. A few hepatocyte show large hyperchromatic nuclei showing signs of regeneration, sinusoids, show mononuclear infiltration.

THIRD DAY TEST



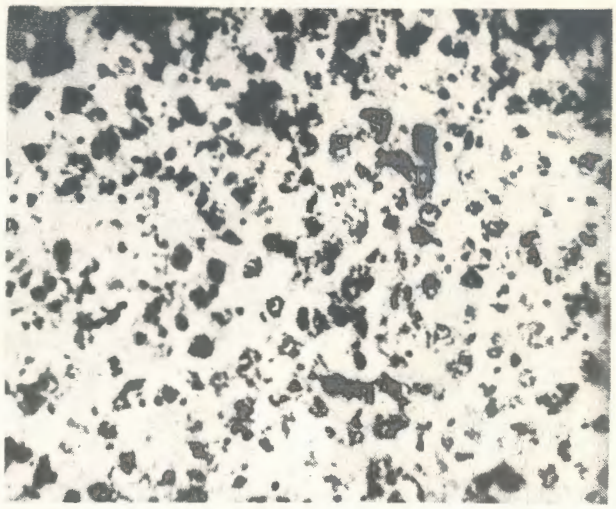
3rd Day Test : Hepatocytes show vacuolation of the nuclei. Some hyperchromaticity of the nuclei.

FIFTH DAY TEST

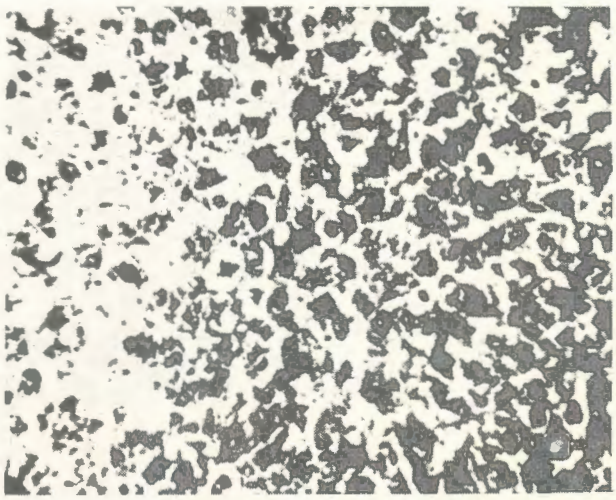


5th Day Test : Many of the Hepatocytes show large hyperchromatic nuclei. Indicative of regenerative activity. A few hepatocytes show vacuolation of the cytoplasm.

SEVENTH DAY CONTROL / TEST

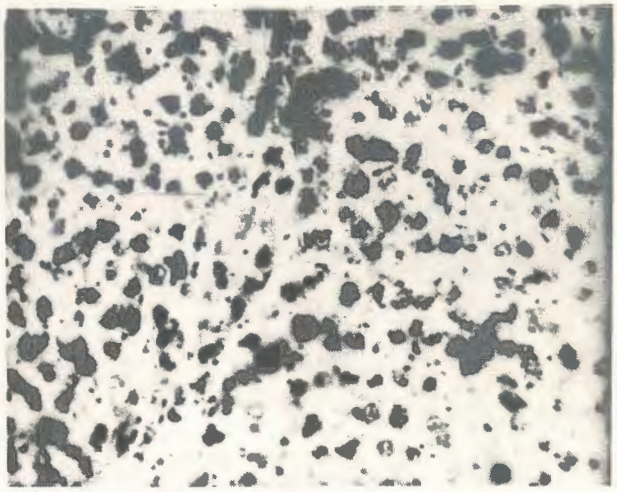


7th Day Control : Many of the hepatocytes show hyperchromatic nuclei showing regenerative activity. Cells on the left hand corner show vacuolated appearance and dropping out effect, regenerative activity has started.

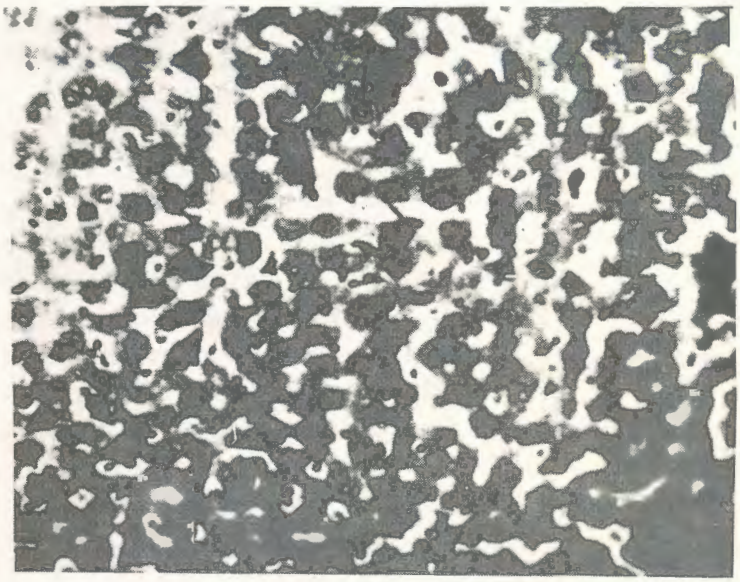


7th Day Test : Many of the hepatocytes show vacuolation of cytoplasm. Stray hepatocytes show hyperchromaticity of nuclei.

TWELFTH DAY CONTROL / TEST



12th Day Control : Many of the hepatocytes show large hyperchromatic nuclei indicative of regenerative activity. Many mitotic enzymes are also seen.



12th Day Test: Regenerative activity of the hepatocytes is complete showing the normal lobular architecture, sinusoids show compression. Kuffer cells are prominent.

TABLE II

MITOTIC ACTIVITY OF CI

Periodic Intervals In Days	Control In%	CI In %
2 Days	2.12%	2.74%
3 Days	2.01%	2.70%
5 Days	2.98%	3.51%
7 Days	2.10%	3.40%
12 Days	1.92%	2.89%

DISCUSSION :

The results of the present study reveals that the drug CI is able to accelerate the process of regeneration of liver and found to have a significant increase of actively dividing cells in the animals treated with Tukhm-e-Kasni (CI) than in the untreated control groups. In conclusion, it may be said that based on the estimation of liver weight, Tukhm-e-Kasni (CI) does stimulate the liver after partial hepatectomy to grow more rapidly and to a greater extent. There are two possibilities for the liver to regenerate faster. One, there may be a stimulatory substance, released by the hepatectomised liver, the secretion of which are augmented by CI, owing to the presence of a biostimulants in it. In support of this view, evidence comes from the reporting of Namasivayam[7] who concludes that serum from partially hepatectomised rats stimulate the rate of regeneration in another group of partially hepatectomised rats. The second hyptothesis is that CI may increase the sensitivity of the liver tissue to the action of the stimulatory substance without affecting the secretion of the same. Further studies are needed to check the validity of these two theories. In the mitotic activity studies the test group animals showed that the highest mitotic index was at the end of 5 days (3.51) but the maximum percentage of regeneration was at the end of 12 days (221.9). But at this stage, the miotic index has declined to 2.89. Upto 5 days, it is possible to correlate the increase in mitosis with an increase in liver weight again. The same applied to the control also. In conclusion it is seen that the pattern of mitotic activity is qualitatively similar in the control and test group animals but differs only quantitatively.

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6. Mohammed Azi

7. Nafis Bin Auz Bi Jamaluddin

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9. Shaikh bu Ali Bi

10. Sultan Ali Tabi

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