PRNC033

PRNC 33

PUERTO RICO NUCLEAR CENTER

The Renogram as a Tool for Evaluating Patients with

Cancer of the Cervix Uteri

[OPERATED BY UNIVERSITY OF PUERTO RICO UNDER CONTRACT

NO, AT (40-11-1852 FOR U. 5. ATOMIC ENERGY COMMISSION

---Page Break---

THE RENOGRAM AS A TOOL POR EVALUATING PATIENTS WITH

CANCER OF THE CERVIX UTRRT

Seno Inary

sanvian Areuicarions Ovistos, Post Rico Neecursn Cearea. Usvansiry oF Peo loo AND Ta

Drparowirer oF Masiciny oF Thr b Gussutsz Marsan ONcouonte Heel

Anant 1 Hooaiot® Kosion

vr ano Deranasene sn Magis of tte Sos Twos, Cory Homer,

San Haan, PUERTC RICO

Ramcisenare Laven

Abateat

?The renogram as tol for evaluating patients wih cancer of the cervix utert. ?The purpote of this saport iso went desi of the incuope reneyram in Ue eveivation ofthe patency of the urinary treet and renal

ran inpstimne aitn nant of the cervin, This cancer nthe fet reoplnste problem in women in Puerto Fecnseltee age of 41. Because in large number of patients the siense im dingnoned Tate the problers of

secial tenrrasren ty the case becomes eriteal for managrornt Te mf importance for te wrgron to kaw the many cf the pateney ef the unaary wtream ?The rologet wants to know the siflerence between » blodked

tisiuey tint a sll faretuning ands blocked kitory that is out of ordre, an that he can decide when to do eco resive carpery, The renngrem diferentes a noafunetunirg Xney from a blocked kidney, whieh Gilersutiatinn i aoe amaze psable with the excretory azogeam,

Seeeeadty gatinte wih alvunced pelvic ewer, preferable cancer ofthe cervix, sage TEL mene selected

* sbactnes Oncolegie Monta -

w onthonatohipgume eid} wa injreted ancaveourly in a dove of Y ae per 8 kilograme

wean Tis rvtmectiviy levee were followed vp cer cach reaal aven for half an war wring surface

ciNtitutan ccaners The actity was aenrored with eateries comnerted (0 xn elart rerordern. Twenty

Tout nationte sere rane of whieh 18 ha crrinson of the cory mage HI. 15 had norma renal funetion

ae ceerits ulam ac freind by both the seotope ort aad fhe mntzaserou pyetogran Eight patients bad

SMaceral fuvetin in. both tess In te patente the uals wets at vasiare; one was normal by dhe ernogramy

Tat os stnwnnat by the usageam, and the oxhsr ner the reverae. There are (our cates in which he renogrars

due mare inermtion at forthe nature cf the cena stating: two easce aon rreerable kid damage vnilte

wily uh rewrreble damage su te contrlaral Kalneyn. ard hth cates showed hydronenbrosia by the

eee Te le ocher asen e reongratn shores abnrn of excretion and reral funeticn whetras the pyelo~

SRR ARLE WP ctaal tneton, here wae rapite reretathm Beceem the 18 rnsgren and pyelo~

ara bet tne nat of ight renorramn failed to correlate wih te Hetactioan yyelogram and vie serwn, The

Rant the urinary ayauns on) be of three types 1 Hivae cme? coeeteny, werrlary, or bith, Compatioon

are cronmatine gen uv the renogrent =i (3 inteaverear pyebaram lade ove to belive that the rene

lamumy br of waive i pring beth fhe patene of theater sv the Set of focion f de renal paren

seerse Fe teoyosney ef ucleral compere wan Ono fit tm the apuup of stg TAT enrcineun of the cryin

aan erection, the renqram npnears se gil 8 ?ie stzavenotsceogrorn im dewunetrating distrbancee

wir al ecerton ad mupering for seen secretion, Sor he sick rancor patil ths eat perme to be more eutable

sere mire rrocedare tor shoormalities of che ral apparatis beeaue it en be dune more easly.

t

Rerames

Valor del renograma come instromente evaluador de cancer del cuctle uterine. El propéeito de eta

memes ia enalisar rl ryior Je. renograme se iiapne gata evaluar ct eatao de patente del sistems ernario

Si'tuncon ena en pacientes von cher everica. Fate fj de ebneer ctauye el pblem principal neo
a

---Page Break---

we S. RLeARNY AND ALL AoOWOCEE

pldatico en lav sujeee de Posrts Kio, pasadea lor 40 afve de edad. Oebide a que en on gran nimero de
pacientes la eulersiecad dingueticnda tardiamente, el prablema dein compresign ureteral pr el tumor aaume
lun carketerertico. Ea importante para el cirwjano conver el eviado de abertara de tas vine utinarian Bl
?rélogo, por ou part, precina cooocer Ia diferencia entce vn fn Ucqveato que todavia funciona y un ria
bloqueado que eat eatrepeado, para decidir ol memento uportuny de una intervened quirirgca. I renograma
ceatablece la diferencia evtre un Fin que n> funciona y un én bloyieado, ly eval no sempre poible om
urogame excretoro,

"Para cate eatudio w piv pacientes coo chncerpélvio avansalo, de preferencia chneer de Is cervie ea

1 etadio TI, del Heaptal Onecldgiea 1 -Gonsslen Martine

Se inyootd en forma intravencea Hipputove "I (Aciio hiphrico marcado con yodo-t31) en una dove de 1 pe por 3 kilograncs de peao de Ia packte. Se oberraron ln nveles de la radiactivad sobve exis Are reaal

durante media hore wulaande cantadeere de ecntelleo de superfine Se did Ix actividad co intenimetzoe

?onectados w regirradurte gréiou de bnmda, Se exurionron 24 pacientes, 18 de alias gun caninonm de Ie

cervinen sly exereci de orita noctielet segin fae devermsnado

" intravencao Ocho enfernin tovieroo, ef atubae pruebas,

funeiones anorales En don pacienten ow rvulladon tg lau pruebas prewatarn diacrepancias, une prucba

eauto nora con el renogrema y anormal evo cl urqgzama, y Ta otra cié reuluados opuestos. Hubo cuatro

fatoa co hn que el renogrema brindé mayor inforuaeiin acerca de la condiea de low tires: en dow eaton

Indies dacs lreversblen en um rita con dace ruverbles en el itn contralateral y,e8 amboe eas, el exatoea

con rayon X presents evidcnein de hidretnne Ea olcoe doe enson, el renograma indich ausencia de exere-

ci y funcién renal, mientras que el pic grama meaté auseurin dela fuseiarezal abo completa

correlación

?entre le 15 renogramas ¥ pclograumas, ero uno le exa acho rewogranine 00 preeeats earelación con el piel

?amon intrveneeo y viceveron. En esto cngor ls Iosyes del astemia urioue9 poeden wr de tes tip: exere

torias,sereorins, 0 amnbat. La eoxaparaciGa de las infornacworw dadae pur el reavgzaina y el pilograme

intraveoaso oe leva ala eeencia de que cl trnograina puedy ser de valor paca jutgar tanto ob cvtad> de patente

de Tou urétees como Ia iatogrilad funcional del paréonuiion renal. La frecuencia de compres ureteral eo

?este grupo de pacientes con eazeiouma de la cervis del iter, en el eatadi TIL te de dos quinton. Ea conehu-

?én, el Penograma parece ser tan efecivo como el pielgranin intravencao para revelaralteraciones dela excre-

?ia ?renal y superior ain para la secrecin zenal, Para el eafermo de ehocer esta prueba parece ser mks ade-

?eunda come examen previo de ancenaluades el aparato renal pesto «jue puele scr realrada con mayor

facia

Valor do renograma ns determinesto do cstede do hacer uterine cervical. 0 objetivo vinado no

[preventeeetudo ?analserovalce do renograma wotipicn pars avaliatne & desobatrugho dus vias urinirian ¢

{tunel renal em enfermine acometidas ie elncer cervical. Este tipo de chacer conti © princico problema neo-

pldatico. em Perio Rien, votre mulheres snaiores de 40 anow En caaio de ser tarda « ingaose ia dowaga. ext

largo mémero de essen, « problema da comrremio wretdicn, exereda pelo tumor. awunve carter eitieo, & de

sande importincin que fo couhega 0 ertada da derobatrusdo das vias urnérias. O urologate. prsiaa

foabeeers diferenga ear 9 im obstruido, porémn ainda funcionsndo, eo vim obstruo « ponto dr nko fubehonar

mais, de mode s price deorminar mace exnto java a snterechiha devecanprssiva. U renograon inden

f diferenga enter uns 1a que ccweou de funcinnar, © autre apenas obvtrulde, © que nem sempre 4

postivel

conseguir por meio do wwograma de exer,

(On casos, apreseriadon ueate estas, de cineer pAlvieo avangui, preferivelueace cincer cerviea! na fase

AT, foram seecioanson no. Howpital Onevligico 1. Gonailet Martiner

Fiseramae injegdes endavenonas de Tlipputope ?T (dei hipirico mareado com ido-I31) na dove de 1 pe

por 5 quilograma: de péso da enferma Os nives de radicatividade fora obwervados em cada uma das éreat

?intilmetros superficial, medindo-se a radkatividade por meio de aperlhon

Tigadoe a repatradores autoniticon de fits. Vinte e quatro pacientes foram extminadas, dae quaia 18 apre-

tentavamn carcinoma cervical ox fase TIT; 15 apreseutavamy Fangio repal ¢ exceqdo de urina norma, determi-

fades tanto atzavés do exame wotipico como do pielograms endovenowo Oito enfermas ruvelaram, em arabae

?4 provas, fungio anormal. Em das outrs, 8 exninge variatam, tendo o renograms normal, poréa anormal

---Page Break---

S tpere. Bere toe adveat of the renograas th

IENOORANC IS CANCRR OF 1

coemx Tent 168

?rogram, en 1 ex, dano-teo reverso coin & outra pacient

?meee toni iors ackren sla condighs doe rine: cm doin indict snnow irrevevvia em tm rim, com

?how reverlveie no ovtza rns, evideneiando a raioe-X a existéncia de hideonetrose em ambrw ow eaeon Ems

ths dove easoa, » eenograniа toate existe wusinca He eereeun de fungdo renal, a paseo que o plelograme

dtva ausineia de fungdo renal. Verifrou-se comple rorrelagoeatre 13 renogranis ¢ pielogramas, porém de

dda vito renogramas unt denxea de corelationar-se ?out 0 respective pielogram endovenoee, e

viee-vere.

"esice do sistem urinio podem ser de (és tips nos sngutes eas exeregio, sree, 1 ambon A eom sragin dan ilormagics rnorsise pelo renngraina com ae dla piehranie enovenosn leva A ere que © Ten

fia ¢ de valor tants para apterin sc a Uravbetrutin de ureters, cum a intesriiede fncionat do parkagui-renal freqifacin de comprosio urtérien, me whup. eureespanien w 40% entre pacientes com careinoma

?rina vervient na fase TH. 1 renogratsa ci noni, a aligiva ta eftivo «ant 0 ptlogrania endovenoso

cra revelarpeetarbagies da vxergao femal @ ? superior jartsverogia renal. Relativamrnte & eapeeronn. éte

?toe por ver muir fil, ve alguns tae comveoniente day ioeeoe le bina te nomatine d0 aparelbo

Houve quatro aasos em que 0 renograma

In 1954, Taplin, Morosith aul Rade © develop

fe itotoye meserans Winter? im the tame sear

5h) tesbuend MC elmiral pratice Tn PST

1058, Winter "south the value of the tet

?soning provehure i renal heyettensn, Doc

bere * on 1959 found geet core lation betwen the

ram aod her cligieal atl radlopen! Bode

Patient wil ntructin of he Upper Urinary tne

aeiqaer Rowad* fond romplete eorelaton be

?een abmoriin pelageaphy bl rencarame ih a

Gy of 2 patients Zinn Winkel ? i 1961 eoudsing

f Urinary? tract and renal function reported 852

rrelstion between thy renegram and the radiographic

fina gro 108 patients ah absoring)

?The pucpow of thie were eto describe our experi

se wit the intape rnogrant in mvestigating the

Nears af the irae outBow wf pativnts with eaenee

the svrets lets This form wf rancer fs th anort

valent form of maligaaney in women stove the

12 0840 in Puerta Rico. A large proportion of pa

?ote untortstely come i Inte for slseroae then

fir tw sae 4 mederately or sever asteanerl At

Se eage the prim of nertral empeessian bythe

tne and hen, interfrsire withthe winaey ont

?x, becomes ertival for manager Bei of pita

(portntire for the airgeon (a Root the satus of the

teney of rhe utinry steca. ?The urlogist ante

Aifereutite betworn a hokey vith, geal

set wd a Hockod Kidney vidhoal funetion, 20

At be ea decide whem ws attempt deeomprenice

CC porebte in many instances with the une of the

tual lines! proesbies for evaluating the renal fune=

tm Nowmsy, with the ate uf the Femara we mas

ible biferentine a noatenetioging Kiseey From

locked bat fet nig i

Materials and methods

?This stude was dave on 24 patiots with doenmented elsie malignancy undergring radiatherapy wt the TF Gonaiiea Martner Onevloge Hospital Dingnoais Aas tstublised by big. xn Tage extension of the fisas was deterred necording to aceepted inter-national criteria for caseifyingeareipoma uf the fereis Ue tages. Additions information was obtained Fy roorio laborajury examinations. blast ehemiatree, foal function testy, inteavenont p3elQeramt, A rystowey

?The eenngraphie attire were entricd oat Clinical Appienions Division nf the Puerto Reo clear Center unngindine 1 labelled orthoiohi

cid tained i ealbrated form era fe injetion

Feats Squiis Relioparmarewtiel Dyviion Th tech

?ye isthe eat at that eserbd by Winter ata.

The patient is psiton imo aah rai wth eae

spar. hie lain facing the bite! part of the ee

is rk reantning free for adrquate placement of the

Aetertars ?The tnteetoes are mae up of 17 XT

thalliom-activntd sade He seitillatin ergata

follimated ya lad abel, with wn opening aperture

ft sae asl i inces (HA) and depth vitae eresal

Tov aqeetire nfo and 2 inches (174 sublending as

fogs af 20°. The instrientaton system cansits of

rintlation detectors, sntewetery mil tip chart

Tenner for nimultancous recording of activity over

fark renal arew Hippirie net 1°" ejected Anta

enony in dow OF pe pee 3 kof body weight

Pr dae of rasioutivity injected usualy ranges 10

to. 20 pe pee person pe est, which hasbeen eomsidered

{ogive the patient lets than 1% of the radioactivity

faced by x single X-rey expowurs Renograma

tere interpreted areting to the eriteria of G. ¥.

Tain etal" Wher hippuric aed is injected

there a tia alae uptonight peak of activity

---Page Break---

8 muuaary 0x0

1 poomoues

?hat occurs in few seconds and representa the vaseu-
lasity of the kidoeys, (Fig. 1, eemect A) followed by
1 rcond let seep rie of the curve dating the next 3-0,
?minutes. This i the interval of active tubular extrac-
on of tbe labelled substance from the Blood, (ee
tment B or accrtory phase). ?The iat portion of the

curve beyins wt the peak reached at B, and this in

f plateau near background 15-20 minutes later Thie

latter portin, called segment (repreente the excre

tory funetion, which ia delayed when there ie difculty

with the urinary outfow

?Twenty four patients were examined, of which 18

?had earcinom of the cervix wer, age IIL Fifteen

?ad normal reaal function and excretion of urine as

reflected by the renogram, the intravenous pyelograra

fand other clnieal tvs.? All the aboormaliien by

Te

DurmmuTiOn oF raTiENTs By staces?

?ca CERVIX UTE

t

1

?Toul, ?

fither the renogram oF the pyelogram were found in

the rage TIT group. Tn seven inetances both teeta

the renogram and the pyelogran?were abnormal;

there was ooe false negative and one {alae positive renograin when the renogram was evaluated sn tera fof the exertory urogram. The PSP (Table ITT) was done on 16 patients; 11 were normal and § abnormal; too of these were found abnormal by the Xoray of isotope exaninution, two had diastole hypertension, sod no explanation wan found for the Aith cage. Ie the group of 11 acral PSP, there were 3 abnormal tice decacted by the rerogram and the snteavenous yelogeam,

?Lack of vinalsstinn of the dye contrast media o¢- curred in ? stances This was auociated with nom fonetioning kidneys. ?The renograms showed a putters

Tae

CORRELATION OF RENOGRAM WITH THE TETRA.

?VENOUS PYELOGRAM BY STAGES

?mal terme

?Savwmat?hooreal

Score Somat

Toul 2

---Page Break---

Seoml?hnormal

Sot cma

red Seema Sora

Tout a

of abwent Kidney in these four cates. Hydronephioni

?ecumed in 4 inmances, This was accompanied by

tilater! Lack of Kidney funetion in two, and bilateral

Tous of function in the other two.

Disewson

?The value ofthe isotope renogram to dteet impair

iment of the excretory function in divesacs affecting

?he upper urinary taet bas been well entabliahed frm

the work of Taplin etal," Winter ef 8 amt

Donneberg:? The protfem of wretaral compremion

bby carcinoma ofthe cervix is well known by te ein

a

ee

cervix uteri in 689% (00/198) of hie

tls found 85% cornlation between the

and the IVP.

?Te this group of patients the renogram and the

IVP showed 1 high degree of correlation 15/18 nor~

ral, 7/7 aborts, one fale negative and one fale

postive. A flee positive in moet inetances la peob-

tly Jue to portional factor; thin ean. be ebacked

i

in 7 out of 1

ISuthors (ib). "?" ?Thin may be related to the sae

of oar anmple

Correlation between the PSP, renogram, and IVP

wan bot good. The lesan of Ube urinary tract in eam

or of the cervix ia primarily an obstructive phe-

rer

?Rvcorma enogam. No heaton org Obrton ot et.

---Page Break---

163 S. mitaney ano At moomoUEE 8

ee

Aol cenogr, Bian ert, Tota eal futon

nomenon, but eoaner ot lave the seretory function of

?he rena parenchyma may bs impaired, and wisely

the vascular Row will ns» be affected

?The renogram ism tert tt can be easily pecforme,

can be done rapaly, is nontrautoatic, can be doe it

All patente, and has shown a high degree of core
tion with other clinical teste AL Sines it may ever
{ve Inforination not obtsinable by other meats.

Tin two of this group of the four patient with hy ro-
nephrosis, the renogram added valuable information
by showing unilateral and irreversible Ine of Kine
fonction with blocked bt preserved eonuralatern Kid-
nays (Fig. 2). This informatien cannot be obtained
from the IVP aleue. In axuther two cates (Fig. 3) the
IVP showed no vininlistion, while the renogeam
showed this was due to lack of Kilner funetingy
anclusion that canaot be reached on the bass of the
IVP alone

REFEREN

(1) TAPLIN,G. V.,41 af US, AEC Report CCLA-366

Sommary

41. Twenty-four patiea's with cancer af the cervix were atudied with the { hippuric acid ren0-ran, intravenous pyelography, and aer linie

tea,

2? Eighteen patients had carsinama cervix uteri sage I all abnormalities detected bythe eaogramn and IVP belong ty this group of patients

8. Approximately two fifths ofthe patints (7/1 ?hed sige of uretral coropressou ee shown by ?the senograeus or IVP.

4. Contention between the rogram and the 1VP

ju of the renogram for detecting wbnor-

rualites of urinary exeretion and renal function

Inpatients wth enncer ofthe cervix, particularly

stage TIL, in dincuoed

CES

(2) TABLIN, C. Val J. Lab Clin Med, 48, 86 (1956).

(8) WINTER, CC. J.T rot, 16,2, 182-196 11956)

(4) WINTER, C.C. J. rot. 76, 107 (1859)

(8) WINTER! CC. ?Auser J. Roentgenol, #8, S?2 (1959)

(8) DONNEBERG, T.teta Chi. Scondinave, 115-231 (1960)

(2) RODRIGUEZ-ROSADO, A. L. Report to u Merung of Puerta Rico Chapter of American College of Pb

ticiane at the Puerto Rico Medical Association, 190.

(8) WINKEL ZUM, K Prt. J Radiol, 94 281-248 (1061)

(8) WINKEL ZUM.K. [buf

---Page Break---

evoonin No CANCER OF THE CERES OTH er

(10) WINTER, CC, el. See reference 3, 4,5.

U1) WINKLE ZUM, K. See reference 8

UAUMPIIS. tied af Brow aint US Tov, Cont, PCAE, ACont 8/2 820 0058)

rat ok, Exhibit 414 AMA Beeting. Miami Fla, 1960),

at al. i.

vel al See references 3.4.3.

(16) DONNEBERG, T. See reference 6,

(IN ROCKLER, H., alin WINKLE ZUM. K. See rrferonee &

i ARCIAL ROJAS, RAUL, A..¢f al. The Am. J of Path, 91, 1077-1082 (1058),

(19) WINKLE ZUM, Ht al Soe eeference 8

(20) WINKLE UM, Ket al Seo reference $.

(21) BOCKLER, IL et «See reference 17

---Page Break---

eprint fr the Amara Jounal of the Mel Stns, Va 24, Na. Nose 1984

THE ROLE OF CALCIUM ON ?THE INFESTINAL ABSORPTION OF

VITAMIN By IN TROPICAL SPRUE.

By A. L. Reowcvrz Rosano, M.D.

17. Suraay, Mayor, MG, USA

Wom the Deparaat of Meine. Sto Juan Ciy tio, he Ces Agecatons

Bee ice Sule Cte nthe tring Mon Tope Pesan Laan,

?Senn Pero ie)

Geasbeck ant Nyberg! observed that an wom Aetna ae

the urary retin dlc eng iin ee lee

tama Ba, caine inthe Schling Yona tmp co, Md om

Tatees ney devrense ie armada, tals mie ae

Inde Sam hk ?St Sr sn Sk

get clyinvdianine ete acelate sis ee, epee me

(EDTA). "This fect was avoided Steg Sa mets of thke Stow

?hen car ace wan gen only a Cebea comet, Fah sale,

wi tbe EDTA soni inbdcd vitamin evel" mese A wot Se oS

Bans Im, 2 serie of experiment, no Cvlabl yay se an

Ba Jn, tert ot Speman, oe! Te hating tne of snk

fnuence the ability of hog itrinic Se ne soled fr Btu iti

factor concentrate to improve the up. So'etur'ms phen ery uh tt

tke of iain Bia by ered ace of Sie i Be, mat, 3

Fat smal Inesoe sol by iver sees yowdrel

?BE zoel Intentog and by lve sees Pia Sie ane ae mao

Caled by? Cooper and. Gui

Cen Oe cere Ret. Theres ofthe fatestinal

?Siuralat) it was reported that caleiun absorption tests are listed in Table 1.

Nae eee eal spect itamin A absorp ws impaired io

to evn Bui logptbe se. 13.0 the 17 pent, Noe soy

forten but not tn pemicoes anemia all bot ne pare

x ee ame (Case 10) The Scbling tex wih oe

snd sGopatic Resorben ME fie fcr and wth lc lactate

secret eetactadTackim cn was abpormal yall 17 patents, Nor

?Beltheeteon of vitamin Busi toph aly the hour urinary exretian of

el pe Tibeled By sapges fromm 10 to 358 of

the adiltered ove In the preset

span bee Sean, tay whey, ar a oe

ean pit, age 1 16 9, wih won! minbtered, the Hehour orinary excre-

Sane Spe nnhel Ties pes re 4

are teeth Tce te pao ne a Oa tl ames

?iin ns oad tettons value of 2. of the orl dose. With

SZ eek es fos Te Sescae Scum ncn it sanged fom © 10

Siar Sagan pel ons: with ea wae of 21

Sarid cnretrn, ?itoriee Discussion, The exact physiologic

SPSEGm IER TR cuMe Sie mechanism of the intestinal abortion

(aio)

---Page Break---

dere nets vn Sgn

sean ean yg © gs mem ga aE BoE Me am = nT

rRaneseeees

Resceear

4 caging wae eniea

ela

«wmv

deeceeceeeeberoeee

Gennanteae Renan

Breeaesessseasssae

ceo)

---Page Break---

of vitamin Bho is sill wiknown, Re- These differences were not significant
only evidence, as bee reported and probably represent fluctuations in.
nich imple calcium plays a ole co herent un the test tell. Analysis of
{he absorption cf vitamin? Bry Glos, Grusbeck?s cases of nontropieal sprue
Boyd and? Stephamsore observed that shows only one person had a sigoiicant
the percentage of vitamin By sbuory- rise in the uritary excretion of the
Sede i nam oa nna fr Qh ml, ln
?stunin was increased. He pox. Inad. In this stance, the vrinary
folated that titonain By ie absorbed cretion rose from a very low value of
{in the distal eum via an intramural 1% t0 208 with calcio
eer mgr th aera Maken ai by
Iechanism, Herbert suggested tht the ents with tropa) speue most likely
tors bound the vigenin Byeintrin- reels from damage to the receptor
5 Ferro th rat nine cron wie rime
find the presence of calium sons is cob, a8 past of the opto
ed he og the copier, caang?s tnd in tis Gaeae (Batter

?Galen, io dsfecive fat cigestion words and. Perez Santiago?). More-

cx sberlin, forms smile sone he Bnding of pot amin

?ith fatty actds aod is lost the stole matic for many years hot with perss-

TKovelts end Janowite!). The amount tently abpormat vitamin Brg absorp-

Lhe on ial forthe tinal on, epg the Carag he re

Absorption is Derefore, reduced. The tor ?may be permanent aod

?once os of the fataoiuble inreparable in roany patient, This

Shain further acceatustes the ine woud explain the persistence of in

GBaency of cilchim absorption, For paired vitamin By» absorption and the

Stesons ?ponding definte cucidation, Falla of calcium or itsinste factor

Gerangements of caldium metabolism © improve absorption,

Ge tcbical "sprue are. practically wn. Summary and Conclesions. The in-

Iesourn inspite of steatorthea testinal absorption of vitein Bua as

"The itil absorption of wai Sued in IP Puer Rican. gets

?By is smpaired in tropical sprue and with tropical sprue. Vitamin

Be Lge ao pears tobe indapensestorpton ie mately pared to de

?Of intrinsic fctor and calcium. Minot Glvease and nether intriasle factor nor

Giderences were observed in the two caleium lactate improved absorption of

Schiling tess dona on each patient, the labelled vitsmin

crane Pe can ih a sea Bley nde

Srcimet es ee ace Gener fr telecon td

Ferd te sol Sapte, MCT, and 3 Meuy Wah for that

{chica enn

[REFERENCES

?Baeeweth Gy Ja sod PeenSentogn, Es Aam, lt Mi 4 6 1858

Basser Saad Can We Br). Cm vey 0, 18, 1008,

Sa Grae oye ee Bn, ie SE nk ed

Cashed, Kanter, Lo a Stl, Ms Lancet. 1, 994, 1950

Rese Nyberg War ?Scandiny, J Clin Lab eves, 10 48,1958,

AT Gi eset, 9, 640, 1968

mad. 3, 1k, 1658

?a Jones RD}. Mt Stal Mean. 24,181, 1957

Shel Tend lates ie Jon Js? Caen ly, 48, 7%, 196

r

2

&

?

&

&

©

=

&

---Page Break---

DEMOSTRACION EXPERIMENTAL DE LA EXCHECTON DE SEROALBUMINA

EN LAS GASTRITIS

Por: Dr. A. Rodriguez Olleros, F.A.C.P., FeA,C.O*

De, 8, Teizarry**

Mise MH. Riverat®

Los estudios, ya cldsicos de los autores alenanes, hab{an settalade 1a

presencia de albdatta en cantidades anoresles en el juge gistrico de tert Restropattas. Katsch (1) estudia y demuestra contenido anormal de a1bénine srel juge gdstrico de las gastritis de las infecciones y las gastritis "serosa! Eote actor y Balker (2) hab{en desarrellado un método a base de 1a turbides gue produce el scispsulfnealic{lice en los Liquids elbuainose

Citein (3) describe ol sindrone de "Hipoproteinenta hipercatabélica? con~ secuencia de la abundante exerecién de seroalbGnina en los casos de gastritis Ripereréfica gigante. Butz (4) lo confirea. Norpoth, Sursan y Glecsges (5) Ussndo la clectroforcsie sobre papel, dequcstran en cl jugo géstrico albéaina de origen ?iaflanatorio". Heinkel, Preisser y Henning (6) comprucban que los Qectentes de gastritis atr6fica tienen una baja de 1a cifra de albGmina sérica Re valor eetadfstico. Glass e Ishinort (7) con la sissa técnica de 1a electron foreeis sobre papel demestran que los jugos gistrices de pacientes de gastritts

Werficial y gastritis "hiperéeida? contienen Ins productos de degradacién de

Ia seroalbéaina.

Materiel y Métodoo:

eaos usado perros songroles de peso aproxisado de 30 libras. Los dos

ates previos al experivento se les adainistré 1/2 ce. de Lugol dos veces al dta.

?Tres perros se usaron para lot estudios de control. A cada uno #e les

tayect6 intravenosazente en ayunas, AlbGaina I-131 "RISA" en cantided

26 uc dklutda con albénine a razén de 2.6 uc x ce. Se odtuvo 1a sangre para

Zontage a los dice minutes, establectendo 1a distribuctén de actividad inicial Beel"fatens, ?Se velvio a obtener sangre para contage todos los dfas sucesivos Guranee 8-10 dfas, sienpre en ayunas. £1 dfa cuarto después de le inyeccién de fsa se hace la prucba de ?btenciin del contenide gistrico. Se inyecta a cade perro en ayunas 1/2 ce de Histalog (25 maligranos). 4 los 25 minutos se ane Pesia con Neabutal e6dien intravenceo. Se incuba el est(mago eatande el perro En decdbitn dequterde y se extrae tod el evatenide géstricc que se descarta.

sProfesor Asociade de La Escuela de Farmacia y Escuela de Medicina,
Universidad de Puerto Rico.

?Director, Divisisn de Aplicaciones Clinte
Rico, Universidad de Puerto ico.

?Sheréenico de Investigad ones, Divisién de Aplicactones Clinteas, Centro nuclear de Puerto Rico, Universidad de Puerte Rico.

+ Gentry Nuclear de Puerto

---Page Break---

Pagina 12, Denostracién experinental, ete.

desde entonces, durante 30 ainutes exietes, se rocoge con aspiracién

continua 12 secreeion gésttien que se mide y se cnvia al contage.

Sc ha repeti¢e ia misea técniea en los siguientes tres grupos

1) dos perros a Loe que durante 64 dias (9 semanas) se les adninisteé

por senda 2 ce de Crcoseca y 2 ce ?Diol? dirtanerte excepto los deaingos.

?tos perres desareollaron 1a Lasada gastritis serosa: congestion,

Attatactén captlar, edesa y my poce componente celular"

Terminado ese pestodo se les inyeetaba 26 ue ?AISA? y se procede cos

henos indicado en les controles.

2) 42 pertes ce les adoiniserd por sonda ghecrica dns granos de cincophen

(atofén) suspendides en agua, des veces una sesana.

?con este método (8) se produce una gastritis ulcerative del cuerpo y del antro del est6oage, Hay nGleiples erosiones superficiales 1a sayordia de

Un milivetro de didmetro. La ténica prupia cot edenatosa y soderadanente {nfilerada con nouer6filos.? (figuras 1 y 2).

EL lunes de 1a seeana siguiente se inieté en ellos 1a prucba con "AISA" fen Ad6atica foroa que en los anteriores.

3) Tres perrns a los que 9 través de un efteter ureteral inelutde y fi jade en una sonda gdstrica, se les instil6 en la parte ale2 del eetéaago, dos veces por semana, durante cinco semanas 3 ce de la solueién en alcohel~ feter,de aceite de croton al 0.57

Se procedié con ellos taysctindoles 26 ve "RISA" en igual forma que 1a deseriva, Estos perros desarrollaron gastritis papiloaatosa (1) (Figuras 3, 4,556,2), Todos los animales de los tres grupos fueron sacrificados una vez terminade el enperinente para el exinen histepatolégicr del est6oago.

Resultados

?Tees onivales del grupo control y 7 aniaales del grupe experinental forsaron 1a poblacién estudiada, Se deterniné el tienpo de seni-desaparicién de la albGnina I-131 y el nivel de I-131 en el jugo géstrico antes y después fe realizada Ia gastritis eaperimental, Coao control de este prueba se hizo Un estudic de a fijackén de iodo a 1a albGaina marcada y se deterainé que

fen 10 dfar ls proseneia de 1-131 inorgéinies coun resultado de Liberaeién

det yedo de la protefna era despreciable = grafico 1. Las curvas de desa~
parteién sanguinea de la albGnina 1-131 sc determinaron cocando valores de
Tadloactividad total y radioactividad de Le fraccién protefea encontréndose
que el valor del yodo 1-131 libre en plagoa con relacisn de 1a radioactividad
Total el dla que se tonb la muestra ghatrica fué 4.9%, (Tabla 1 y gréfico 11).
Se aause que en el estado de equilibrie cuando se mestrea cl jugo gésteico

(1) Esta gastrieis ser descrita en trabajo separado de los Drs.
Rodriguez Olleres y L. Galindo.

---Page Break---

Drs. A. Rodrigues Olleres, Sexgio Irizarry

Figura 91 - Gastritis de Acofts en perro.

pétacsesén

Blandular, edena de 1a ldmina propia,

---Page Break---

bre. A. Rodrigues Olleros, Sergio Irizarry

Figura #2 = Gastritis de atoféa en perro;

Sleera superficial

---Page Break---

Figura #3 - Perro Normal - 6

© paptjonatosa

Dre, Rodriguez Olleros, Sergio Ixlearry

---Page Break---

Figura # 4 - Ferro 8 inst{lactones. Se ha perdido
el paralelisms do las gléndules, comtensa
a dilatarse las glindules auperfictales.
Gastritis paptiomtosa con aceite de
croten,

Dre. A. Rodriguez Olleros, Sergio Irizarry

---Page Break---

Figura 05 - 8 inset lactones; quti
infiltracién célula redendas y al
coxinstilo.

Gastritis paptloantosa con acette de

Dre. A. Rodrigue: Olleroe, Sergio Irizarry

---Page Break---

sagaosa ap 92799" 909 weormorTéed

= op wants

Aaxexyay 08205 *

---Page Break---

---Page Break---

FRACCTON (X) 1-131 LIBAE EN SANGRE

AL TIEMPO DE MIESTREO DEL JUGO GASTRICO

+

jemea | oer |e

T

| peewee eT | oT

oats #9

[

sna Te

---Page Break---

g

?

- y

SSSA greeo-ptas

---Page Break---

PAgina 03, Denestracicn experimental, ete.

1a albGaina cireulante est acompatads al pasar por un defeeto en la pared gastrica al Idmen del estinago, de las fraceiones de yods libre y yodo proteice correspondientes a las que existen en 1a cireulaciéa. EL andlisis del jugr pastrico no se hizo instanténeamente por le que 19s valores del precipicade del jugo gdstrice no son validos para expresar el verdadero valor de radivactividad pritefea al ronments de Is trasudacitn, For eso el valor del nivel de I-131 fijo en pretefnas trasudades se puede obtener aplicando una correceién que se obtiene tomando cone factor de correceisn el i de radivactividad protefea presente en la albdaina circulante (abla I). tra pesibilidad es cnsiderar 1a radicactividad total del juge géstrico crao indicadera de 1a actividad protetca ya que ambos flucedan cn la misma direcekin, Los

valores de I-131 en el jugo gastric se expresan con radicactividad

total 0 couo radiosctividad corregids, Los resultados de 3 grupos

4e anteales en Ive cuales se practicaron 3 tipes de gastritis apareces

4 La siguionte tabla eicade los animales 1, 2, 3 tratados con Diol-

creosera, el 4 y 5 con atofin y el 6 y 7 con aceite Centon.

abla IE

anival ¥ ?TA/2 fas alb.T-131 1, dos 1-131 jugo géstrice 1/2 br.

Control = Experizental control Expertsencat

Act Tot. -Corren ot Curren.

1 (Canela) 9.0 6.2 O16 0.16 2.29

2 Blane) 8.2 56 0.69 0.66 LAAT

3 esentids) 6.0 42 0.57 0433 0.60 0.58

4 (Barquitlay = 6.0 - = 1.03 -

5 (inte) - 6.2 - - 3 -

6 (ate) - 6.6 - - 4s -

7 (abaco) - aa - - 1 -

PROMEDTO 1 3.5 0.47 = 1.66 -

---Page Break---

Pigina ?4, Desostracién expericental, ete,

La cantidad de jugu segrugado ex

antes y después de 1a gustritis c6. pac

Tipe Gaseritis twat

Diol Creosote

Aveta 4

crotéa 6 -

PROMEDLO 66 al 116 at

GqeTTOd fue 0.47% dosis admintstrada y en los animales exretioentaine {RE 1,962, 51 promedie del volduen segregade on 1/2 hore ger tee deanae dee, control fue de 66 al y el voidaen segregade por los aniaales enneeie Deatzles £06 116 ol- Los valores antes y después del experincnto serie senate gates st cl arstice 111 - curvas efpleas 11/2 albGsinecdoe y BrSfico IVT 1/2 atbdmina 131 y actividad del Jugo gusceien?

pirgiminacifn. Gordon (9) en 1959 us6 enn este propésite al relietenL FrlorridonMe (P.V.P.) sevialado I-131 que si se elimina por sl tabe dnt

Te BesagaeLaRetearade se ftja en parte en el retfeulo endetelins porque Jegigetsualdad de sus eniéculas que evan cl I-131 hace que se'ehieteen a,{iferente velocidad tas de diferentes tanatos, y Einalecnte, sicenan Saiructura diferente @ la seroalbéaina sv conportanients frente a ie sucosa gastro-intestinal probablenente no sean ident inces

12 electroforesis acbre el papel ha stan el aétode utilicedo par Norpoth (5) y Henning (10), Glass (7) y Gulberg (11).

---Page Break---

0409 oa

amuse

Goes tein TLENPO-DIAS

wu oF 2a yan

cone UE,

---Page Break---

MAL 1

Dtol-Creosora

onarico Iv

Ore

casznants protncnsosonA, y pest

acetm exer

71/2 Aibentna T+131

?TRASUDACION ALBUMINA T-131

uGo caszaIco

aceite de Croton Atofan

aras

ras.

oy Ba

---Page Break---

Pagina 5, Denostracién experimental, ete.

Bete nétode ha sido croplenantado con la técnica de inmnoclectro~
foresis por Oystese (12) y Murlisan (13). Estes autores han proporcio~
nado excclentes dates sobre las vias de exerecién y sobre lac diferentes
fracciones de las proteinas sangufneas climinadas, Hurliman he denostrady
que el estémago normal elimina my pequefia cantidad de seroalbinina y
Blobulina. Solo en las gastritis andeidas y en los casos de anemia per=

Bickosa 1a presencia de estao sudstarcias puede cdenciarse trmande el Jugo directasente, in los ostcnagos con normalidad clorhidre~pépsica

Recesario nevtvalizar con una erlueién buffer el Juge gaserice segin se va segregand». En el cincer gastrico y en laa gastritis, la cantidad de ins misma proteinas que se segregan en el est6nago norsal, aumentan considerablerente. fur ese en la ?hipeproteinenia hipercatabélica? que fe produce por Getar pérdidus el trazady electrrfrético thene pvr earacter{stica el aumenta proporeivnal que experiments 1a onda de las slobulinas.

Pero el nétodo de 1a electroforesis es fundanentalmente cualitativo.

Beta era la Linitaeién para aplicarlo a nuestro preyocte.

En eatos Gltions aos se ha aplicade al estudio de las pérdidas de proteinas a través de 1a mucosa gastrointestinal la combinaci¢n de "RISA" intravenosa y la resine Amberlite CL. por via oral (5 granos 4 veces al ata).

Esta resina f1Ja el I-131 y le elimina en a exereta donde se dosifica. Wan erabajado en este nétodo Seejeedhoy (14), Jones, (15), Sum (16), Jinénez Diaz (17) y Lizoro (18). Con este nétode se recoge aproximadamente el 07, del 1-131 que se elimina. Pore noraalsente se elimina parte por la saliva y bilis y el resto por ia cucosa gastrointestinal. La

Fazéa para ne aplicar este método a questra Investigacién ostriba en

Jo poco selectiv: que es cusndo se quiere detcrainar exclusivanente

Aa Clisinactin gastrica.

Hewos practicads la recogida directa del juge péstrice segregade durante un perfode de tkeapr igual para les animales de contrel cone para los del experizents.

Los autores antes citados (7) (10) (13) (14) han comprobado que el Jjugn géstricn acti: disveia en pocos minutos la albdwina segregada en La cavidad pastries.

EL juge gésteico de nuestros perros cant controles com de oxperi~
mento tenfa un Ch 1-2. Por esto desistinas de precipitar 1a albémina.

EL 1-131 de la albémina segregada y luego hidrolizada estaba en forma de polipepetdos I-131, cirosina I-131 y I-131 libre, ibid 7, 10, 13, 14.

EL centage de este I-131 en nucstrcs tres grupss de gastritis demuestra

Jun aunene subetancial en relación con lve animales control. Las curvas Gel"turnover'del I-131 Jot suere evidenetan un paralelisne sestenide entre Ya curva del I-13] trtal y la obtentda en La precipitacken de las protetnas del sw ro. Por est puede aftenares que cl aumenti'del T-131 del juge ahstricn procede de 1a albimina exeretada pre la mucosa.

Sinulténeamente el turnoverdel 1-131 del sur de nuestros perros sastri{tins ests francamonte acelerade en coaparacicn evn lop conercles.

---Page Break---

La concordancia de estos des dates, jugn géeteicn y suern, nes Leva
a Ia cenelucién de que en nucstras gasttitie experimentales cs¢S aumentaday
1a exereeién Je albdaina por el esténage.

Hab{ndose conprobado por los autores eitadns 1a pérdida de albémina
en las gastritic huoanas hiperplfsicas, gigantes, atr6ficas ¢ inclusm en
las agudizaeioncs de las gastritis superficiales, la deenstractén per
nosotros de pérdidas anoraales de albémina en clertes gastritis provecadas
fen Los perros tiene valor para proyectarln en 1a elfntea,

Los porros sna probablenente tos animales de experimentación cen
estémagn ois resistente » la agresiin.

2 euy probable que en los humases gastrftiens exvinicas, que coon
cualquier humano que vive la nedicina presente ingiere omm relative
frecuencia sedicamentos que contienen aspirina y antirreumsticos en
general, balsdmicos expectorantes, y minerales de Fe y Ca, sufran egudi
zaciones de su gastritis con aayeres pérdidas de albénina a través de
su eucosa gaserica.

Este hipercataboliseo unido a las inadecusdas dietas en que se refur

Bian estos pacientes para disminotr las solestiae digestivas, son factores

Principales de la mala nutricién de gran parte de Ins gastricicos crénicos.

REsuIEN

Se han penducide en 3 grupos de perros tres grupos de

1) "Seresa? enn excosota-Diol

2) "Eresiva? enn atnfin

3) Faptinnatosa? enn aceite de erotna

En todos ellos se hs realizado

con albaina 1-131 x15 midiende el!

por la suensa géstrica.

1a prueba de tnyeecién ineravenosa

on suern'y la eliminacten

Los resultades se han comparade con perros uormales resultando que los perros gastriticos tiene un'turnovernd® répide y aumentan signi ties eevamente 1a exerectén de albénina I-131 por la mucosa gistrica pie eneian de lo que se pedria explicar a base del aumente cn el voldaen de juge + Bécericn sogregadn.

---Page Break---

Pégina 7, Denostracion experimental, ete.

1) Katsch, G.5 Etvatsagehale des Hagensaftes; Hanbuch der Inaeren Medizin; mt: 516, 1953.

2) Katseh, G ond Baleeer Fs.; ELfaches verfahren eur Erkonncing der gastritis serosa;KLin. wche. 16: 354-561, 1936.

3) Clerin ¥.; Sterling K. and Halsted S..\.: The mechanisa of bypeproteinemia associated with giant hypertrophy of gastric mucosa: New England Hed. 257; 906-912, 1957.

4) Bute, 9.64:

1960,

Giant Hypertrophic Gastritis: Gastroenterology, 39, 183-190,

5) Worpoth, L., Surmane Th. and Cloeges J., Der Tachwess ?enzund2icher?

Hiveies Norper in menschLichen Mageneafe; arzel. echr., 9: 389-391, 1954.

6) Helokel K., Preteser F. und Henning 1l,:Histological findings in the

gastric cucnsa and the serua albuniea level: Klin. Jschr., 39: 193-195,

61.

1) Glass G.B.5. and Ishimort

stomach: auer. J. Dig. Di

bussage OF aorua albumen inte the

+6: 103-133, 1961.

8) Rodriguez Ollervs, A. and Galindo L.: Tke action of cortisone and

?Adrono-corticotruphte hersone on Experisental gastritis and gastric

wleer: Castroenterlogy, 32: 675-668, 1957.

9) Gordon, K.S.: Exudative enteropathy: Lancet, 1: 325-26, 1959.

10) Henning, Wie; Kinylmetr, H. und Demling L.: Uber elelereforettch dastellbaren Protein liormale and Pathologicher Magesafte: Much. Med. Heche: 95: 423-426, 1953,

11) Gulborg, R.: Electrophoreste fraction of B=12 binders in Gastric juice from patientsxith pernicious anemia and from controls. Pree. Soc. EXP. Biel: 105: 62-65, 1960.

12) oystese B and Torgensen 0.; Excreticn of Proteins frrm the human Gastric Me Net. Path, Werobial, Seand. 60: 93-98, 1964.

43) Wurliman, 5.1 The Procein cf the Gastric Juice: Helv. Med. eta. 30: 326-135, '1963,

14) Seejeebhoy, K. te and Gophitl, N. Fe: The measurement of Gastro~ Antestinal protein less by a new method: Gut. 2: 123-130, 1961.

---Page Break---

Pagina #

Demnstraciéa experimental, ete.

15) Jones, 5.H, and Norgan, D-S.: Measurenent of Plasaa Protein loss into gastrd-intestinal tract using 1-131 labelled protein ant dwberlige resin: Lancet 11: 626-629, 1963.

16) Sun, F.T., Hoffman, Hui, and Wester, D.R.: Protein losing gastere enteropathy with Gastrointestinal Cancer: Cand. S. Surg. 7: 1-5, 1964,

17) Jinene: Diaz, C.; Linazore, 5-H. y Serrano kins, He: Eliminsetén de seroalbémins pnz las heces en 1a sefrnsis. Rov. Clin. Gepatnla LQXVIIT: 302"4, 1963.

16) Linazoro, S.H.; Jigenes Diaz, C.: Orefz Mallorens y Criado Ortte, M. Estudio experisental sobre 13 cecreckén intestinal de albémina plas= itiea: Rev, Clim, Lepatole LXXXVET: 362-367, 1962,

---Page Break---

UPTAKE MEASUREMENTS: DETERNENATTON OF THE PROBABLE MixXLMUM DEVIATION OF THE UPTAKE MEASUREMENT AT THIS LABORATORY

De. Sergio Irizarsy, Clinical applications Division, FaNC
Mrs. Hada Livia 8. de Colén, Clinical Applications Division, PANC
Mise Zenaida Frias, Radiotherapy and Cancer Division, PRNC

In order to determine the maximum deviation in our uptake scasurements 4a study was conducted on eight cooperative patients vho were easured re~ peatedly 24 hour after the administration of an oral dose of I-131. Each Reasurenent vas perforaed as if it were a new procedure; that is, the Patient was noved out of the exsmining room and brought back in again

for each measurenent. Phantom measurements were similarly done anew

each tine and the instrunent was changed from position and brought again to the measuring position for the phantom and patient each tine as needed.

The technique used in this laboratory is based on the method publ ished by Marshall Brucer, (1) 1959 which uses @ combination of filters to measure

the phancon and patient's thyroid gland. One of these filters, filter A, 1/16 inch lead thickness filter, {= attached co che lover end of the detector; its purpose being to stop weak secondary radiations coming from the body of the patient, and to allow primery gamna rays from the source (the thyroid gland and phantom) co reach the detector. The other filter, filter B, 1s 3 4x G inch Lead block which is applied over the source in the phantom and patient (thyroid gland) to cut off all primary radiations coming from the Source to obtain background counts

The measurement consists of 4 counting stops, two suitractions and 4a division which are related in Marchal Brucers' (1) formula to obtain the final results as follows:

% uptake by the thyroid gland - Counts in patient ~ Counts in patient
wich fatter A with filter Bx 100
Counts in phantom > Counts in phantoa,
with filter a with filter B

?The phantom we use Lo a phantocube (plastic phantom) and che source consists of 1-131 capsules located at 3 cms depeh in the phantom. The measuring distance is approximately 28 cas from the c rystal and exactly

20 cus fron the lover end of the detector to the skin of the patient or the outer surface of the phantom, The scintillation unit is a 2" Dx 2" sodium iedide crystal housed 3 inches within the detector and the aperture of the detector is 1.25 inches in diameter. The counting efficiency of

this system 1s of the order of 1000 counts per minute per microcurie at 20 cas from the lower end of the detector

---Page Break---

?AESULTS.

72 geasurements vere performed in 8 patients. Each patient was measured soverdl tines and the serics of measurements vere individually analyzed for the gean, standaré deviation and the maximum deviation from the ne.

The following table shows tho data obtained in the ekght patients examined.

Patients tio. a2 3

Uptakes

Gadoiniscered 19.03 44.42 41,55 21.58 25.33 21.79 44.24 36.96

Dose

18.55 43.65 30.61 21,80 24,70 22. 38.08

18. 46.27 32.05 21.98 26.77 22. 38.58

18.48 66,28 30,55 20.92 29.35 21.46 42.98 38.56

18.43 45,62 29.88 20.57 25.32 22.06 43.29 37.49

18.82 45.12 26.91 20.61 25.08 23.26 38.66

19.06 46.02 30.98 20.26 25.72 23.27

18,26 42.80 30,61 21.81 25.38 22.89

16.27 2.86 31.47 20.31 25.36 22.26

reaw 28.61 44.52 30.62 21.05 25.01 22.42 43.75 37.99

5.0. 0.36 116 0,94 0,60 0,65 0.69 0.99 0.65

Max.

Dev. = 0,50 1.72 1.71 O81 1,66 0.96 1.52 1.01

?The pooled standard deviation for the group wae 5: 0.77 and the maximum deviation that occurred vas | 1.72 unite of uptake, the pooled standard deviation may be considered as che probable saward variation that may occur in any one patient to be examined by this method.

T) Thyroid Radioiodine Uptake measurenents 2 Standard Systen

for Usiversal Interealibration. ORINS - 19, Blology and Medicine, 1959.

---Page Break---

{T OF RADIATION THERAPY ON GASTHOINTESTINAL ABSORPTION

(OF 1-131 OLELC ACID 1S HUKANS.

brs, Sergio Irizarry, Clinical applications Division, PANG

A.AcCintron Rivera, Department of Medicine, University Hospital

Victor Marcial, Radiotherapy and Cancer Division, PRNC

Mise Myrna Rivera, Glinieal Applications Division, PRNC

Miss Zenaida Frea5, Radiotherapy and Cancer Division, PRNC

Mes. Carmen C. Villedas, Clinical Applications Divi ion, PRNC

There are many factors which my induce malabsorption difficulties of the gastrointestinal tract. Direct irradiation of the intestine has been considered fone of the aany factors tia can affect profoundly the wall of this organ and its function of absorption for 2 variety of foodstuffs. The alteration of jatrointestinal absorption by dircct radiation of the intestine has bean docu

Rented in experimentsL animals (1,2,3,4,3,6,7)- This problem has not been studied in humans as extensively 45'in animils. There is evidence for and against radiation induced malabsorption to radiaactive labelled fat in the orks published by Keeves et al (8,9) end Goodrich and Hickan respectively (10),

This study was done in 20 pationts of the Iseac Gonzdlez Martinez Oncologic Hospital with cancer of the cervix uteri undergoing radiation therapy with @ Cobait 60, ganna souree. Thin group of patients did not show evidence of malabsorption of I-131 oleic ackd in the baseline study done prior to the onset Of the radiation treatment. Nineteen paticats vith carcinoma at extra abdominal Sites who were going £0 receive radiation therapy were studied as an external Control. None of these patients denonstrated malabsorption defects whem examined with I-13] oleie acid. I-131 oleie acid was aduinistered in capsule form to the

tient in the fasting state and total blood and protela bound radloaceivity por ?timated cireulating cotal blood volume was assayed three to five hours after the administration of the radioactive material. The higher percentage of the dose in the circulating blood voluse three to Live hours atter che adminietration fof the tagged oleic acid was taken ae the absorption value.

?The norwal baseline value for the group of patients with cancer of the cervix uteri wae 13.6 1 4.24 total radioactivity and 4.2 + 2.2% protein bound rad{oactivity. The control group of pacients with extra abdominal cancer shoved a baseline value of 12-8 3-4) total radioactivity and 3.8 3 2.1L protein bound radioactivity.

?The criteria used to establish malabsorption for a patient during the study period of eight weeks folloving che initiation of radiation treatment vas a value two standard deviations below the average value for normal 13.6 = 2 x 6.2 oF 5.2% dose per blood volume. The protein bound values had a high degree of cor~ relation (90% fer absornals and 1007 for normals), with total blood radioactivity values.

Ta the group of twenty patients with cancer of the corvix uteri, fourteen patients developed profound alterations of intestinal absorption as determined by the I-13 oleic acid cochnique, These alterations occurred at different intervals: three occurred two weeks after the beginning of radiotherapy, ekght

in the fourth yeex, seven in the sixth week, and mine in the eighth week.

---Page Break---

ant ap eiNey Of wlterations in the rates of absorption that could be judge.
abnornal by this technique was present one or sore tine: ie sccorve
Teroketienses twice in four patience; threc Cites in throe paeieate aa fous times
in_one Patient. In the external control group of patients the alteration ta ch
rae ok absorption that could be considered abnormal cccutred only oace on chene
patients:

A gimultarcous Vitamin A absorption study was attempted in some of these
patients in collaboration with Dr. A. A, Cintron Rivera, Serial comeat eee
TEES OE done tn enough numbers on those patiunts to permit satteiectess
STS; Mirteen patients were re-examined sonetine during. the uty period;
GaRDE fattente once; two pattents twice; one patient three eines cal Yue pacsints
Foor oests cy uormal vitamin A tolerance curves vere observed on sever porters
Eoer of which were in the following six weeks. No good correlation wen pants!
Detween I-131 oleic acid anc vitamin A since five abnormal vitesie A sereee

Sernglated with eleven abnormal oleic acid tests; and five abnormal oles acid

ThiMgs Gorrelaced with nine sbnoraal vitamin levels. The following cable sivts the lack of correlation

abnormals for oleic acid and normal for vitamin A

Abnormals for vitamin A and normals for olete acid

Abnormais for oleic acid and vitamin

Normals for olete acid and vitamin »

The evidence found in this study favors the conclusion of Reeves and cox erste (21:12) who claim that radiation alters gastrointeseisal absorseton of Aids labelled fate and in at variance with the evidence given by Gesdriee an, Esan (13) who found no evidence of malabsorption in patients, radreced ken a Cobait 60 ganae source.

frelisinary data on vitamin A absorption in a Limited auaber of observations Seatome of these patients 1s also suggestive of impairment of gastroleeecicas Synction by radiation. Lov correlation between vitamin A and Sleie acid te nee Gfesurbing because it is probable that both substances are not necessarily absorbed in the sane way (16, 15).

---Page Break---

1

10.

a

12.

1.

ue.

1s.

REEERENCES

Walsh, David: "Deep Tissue Trausatiom from Roentgen Ray Exposure?

frie.? J. 2s 272 1897

Warren, 5.1. oné Whipple, G.H.: ?doentgen Sax Intoxtestion = BacterLal

Invasion of Blood Stream ag Influsncet by Kara lestruction of Mucosal

Epithelion of Smill Intestine? J. Leper. Wed. $8: 13-723, Decy 192)

Wallace, ¥. 9.: "The Intestine i datiation Stelneas. Gross Effect on

the Saai1 intestine of Protracted Dep Pelvic Irradiatlos.? JAMA 116

585-388, February (941

Conrad, R. As: "Effect of XIreudation on Intestinal Hotiliey

am. J. "Physiol. 105: 575-385, Imy 1951,

Greenfield, Ha,

Gastrointestinal Transit? An, J. of Physiol. 169.

236-241, april 1952

Buchwald, Ke a: "Influence of -ray te:

Absorption of Glucose and Other Sugars.

Suly 1931

100 of Intestinal Mucosa on

Eiper. Med, 33: 827-833,

Mead, J. F.: ?Effect of Neizvadistion upon Fat absorption in the House."

3. of Nutrition 45: 4857499, april 1931

Reeves, &. J.:"Eat sbsorption froa the Husin Gastrointestinal Tract in

Patients Undergoing Radtation Therapy.? Radiology Vol. 73: 396-401,

Septenber 1939.

Reews, et al: "Fet absorption from che Human Gastrointestinal Tract in

Patients Undergoing Telutheragy.? The American Journal of Koeatgenolony ,

Radius Therapy end Nuclear Therapy, vol. 69, 0. 1, 122, 1963.

Goodrich, J. K.: "Oleic seid I-14] Intestinal Absorption in the Pelvic

Cobalt 60 Irradiation.? The am. J. of Roentgenology, Radim Therapy and

Nuclear Medicine, Vol. 67, No. t, January 1962

See 9 above

See 10 above

laevis, $. Rovere: ¥

Press 1960, sew Yorie

?amine ané Hormones, Vol. 1%, p. 388, Academic

Seshadri, Sastry ot

A: Indiac J. of Medical Hes. 45, 263, 1957

---Page Break---

TIROIDEA: CORRELACTON ENTRE GuUMUGRAMA E HISTORATOLOGIA

Por los Drs. Sergio Irizarry y aldo Ly Lunaro

Diviei6s de" Aplicaciones Clinicas, ventro Ive lear

de Puerto tice

Mucho oc ha publicads ya sobre Las caracterfstieas del gamragraoa de etroides y su sigaificade ex el diagnéstico del edneer de esa glin= dula. La correspmadencia enitre 1a actividad de una zena, nodular ¢ na, y la anatonfa pateltgicn de ella ha side objeto de nunerosos estudios Catadfoeicos.

Ya on el ato 48 Feitelberg y colaboradores hacfan medicines Inca Lizadas con un tubo de Geiger Muller blindade con plone para dejarle un Pequeio Sngulo de abertura, tracando de camparar le que Mansba perfil

Ge actividad con las caracterfeticas anatono-patológicas de las distin= tas gonas. Elles describen ya, 1a causa que todavia actualmente evnei= deranos cone 1a mis importante ?en 1a falta de earrespondencia entre

baja actividad y e?lulas indiferenciadas, que es 1a superprsición de planos de distinea intensidad de funcifn que pucde stewlar funeién normal damde existe una soa frfa, De cualquier sanera elles describieren el métadn ono de utilidad para la sospecha de cejido neoplisico.

Este aétodn se vié muy simplificade con la intreduceién de ins ?scanners? que realizan autondticsnente 1a medición por emnas. Sn 1952 Daher y colaboradores deseriben 1a relackén entre anonalidadcs wor fale gicas y 1a imagen del gammagrana.

A partir de entences se han qucedide les trabajos donde cada Centro de aplicación de radteisécopes presenta su experiencia y Las resultades estadistices ebteniae:

Entre ellos pedrenos citar los de:

Perloutter, Slater y Attic del ate 1954 que en 85 nédulos solitartes de 24 calientes ?ninguno a5 ealigno, en cambio entre los tibies lo cs el 20% y onere los frfos el 32

Johnson y BeLervaltes en 1955 que hallaron 31 de careinemas nfdules frfos, 10% en Ins tibine y ninguna en los calientes sobre

en total.

Greene en 1967 acepta siendo, dice, muy conservador entre Ins Erfos el 20% de eéncer y Manandn La ateneiAn?sobre 1a prsibilidad de que el te}ido funcionante cubriends la neaplasia de un afdulo tibin » caliente ara lo cual cugiere se haga inhibiei?n enn tiznuina para ver si son indopendiences.

Groesbeck que snbre 253 cases operados da entre Ins eufuncionantes 3,6 de malignidad, enere Ins hipnfunctonantes 14,2 y OF para los hiper= Einetonane

---Page Break---

Pagina #2, Patologia Tiroidea: ete.

Meadow en 1961 que bactends diferencia entre nddulos ne funeio= nantes 2 bipetuncionantes dicc que entre los primeros 1a incidencia de cancer es dei 382 en 26 casos.

asta Legar basta lane recientes publicactones de Rose en 1963

y disehe en 1962, entre otros, que dan una correspondencia senejance entre Inspofuneionante y careinosa.

ata conunteactén, ne trae ninguna gnvedad en este campo, tiene Per eojete solamente prosuntar nuestra experiencia y los resuleades cbeensdes ebsete tla on la Divisién de Aplicaciones Clinicas del Centre Svclear de Puerto nico.

Se han repasade. $43 gaemagranas de tiroides que se han realizade en ?wtn pivtsién durante los aflos 1962, 63 y primera aitad del 64.

onando cl cotal de log pacientes los diagnésticos semiclégicos persiven agruparlos en la siguiente manera

Diagndscice Min, Cases b

Nédulo gnteo 267 4s

Rocke difuso 1% Bb

Céneer de Tireides 66 2

Bocie polinedular ar 945

?Throidicis 2 25

Restos de conducto tiregloso 9 2

Sin @lagnéscico previo 88 Xe

EL catudiy de lor geSficos obcentdes en ese grupo de enformes Heva

a hacer la siguiente clasificacién.

piagnéstice Hém. Casos 2h

rOdulos frsos 105 9

Hédulor tibies ne 2a

Nédulos caltentes 7 3

Ceptacign uniforce 143 26

Captaciones irregulares 16 3

no clastficables

Entve los de captacién uniferne se conprenden bocies difusos y nédulos cibion que ne habiende sido eareades previanente no pueden diferenciarse Sorel ganoageama del ceste del cejide glandular. 1 Gl¢ine grupe coe Por ie he captactoncs irregelares yen su sayer parte pactontes que habtan reson ctados previmmente, que tenfan algén problesa de cuello que scracts see tigorae desde el punte de vista tiroideo ain ser un process glanduiery sevee en capeacién ca generel auy baja por diferentes motives no siendo

fanning? denostrativo, ofe.

---Page Break---

Pagina #3, Patologia Téroidea: ete,

Para realtzar estos ectudies se dispane de des aparatns Nuclear cnieage. Uno con un eristal de 2 x2 pulgadae y un colinador on panal

de abeja de 19 orificios con toca de 13/4", Y el etro con un di spositivo para ?fotoscanning? al cual en 1a actualidad se le esté agreginde un tubo Se rayos X para hacer placar de locslizaciAn simulténess, quc tiene cristal de 3 x 3 pulgatas con for de 2 3/4 pulgadas, con un gran blindaje y enn colinador senejante al anterior de 19 ofificins. mbes con el analizador electrénico correspondiente,

Se coloca al paciute senstale con un alachadén bajo les hneben: habisndose dado 24 horas antes una desis de alredednr de 50% 100 ue ri.

Se proyecta 1a imagen de 1a tiroides, con sus ancraslidades, y el ioides y 1a horguills esternal cone puntes de referencia, sebre una nja de pliofile colocada trrizontalsente erbre cl cuello y esa teagen se transperta sobre cl papel recoptor del ?scanning? para localiza.

De todos esos pacientes estudiados ce han seleccionade 64, que habiendo realtzadn tratamienta quixGrgice tienen adens efectuade el exinen anateno-patológicr de 1a picza carresprndiente.

Entre elles por el gannagrans podenos citar:

Nédules frtos a

lédulne tibine a

UAdulos caliences 4

Captacifn general baja 5

Capeación irregular 3

Por otra parte 1a anatenfa patelégica senala:

Prneesoo salignes 23 (362)

Procesos benigoos 32 (502)

Tireiditte de Hashisorn 4

DiagnMscices varies 3

Entre los ben{gnos prdezos diferenciar 26 adencaas y 6 quistes

honorragicos.

La enerespendoneta entre estas dos agrupacicnes es la siguiente:

Nédulos fetes (31) + Peneesos nalignos 15 (97)

Preeesos Senignne 12 G91)

Peecesos no tireiders 3

(ietdstarls de efncer

ne tiroideo)

Haghianen's 1

Néaulos eibins (21) Process salignns 7 G32

Procesos benignos 13 (zn)

Hashineee' = 1

---Page Break---

Pagina 4, Patologla Tiroidea: ete,

Uwhdutes caLtentes (4) + Proceses salignes 6

Frecesos bentgnns 3

Hashizote' = 1

Estos resultadns que en realidad nq sen tan definides en 1a diferen+

etación cone Ips que relatan ofr autores ann Ine que besos obtenide

fen nuestro medio y esta aeordes con el concuptn aceptade de que las

?causas mife conunes de los nédules Erin arn el carcinoma y el qui

hemarragico. .

---Page Break---

The Use of Thyroid Trapping of Iodide as an Indicator for Absorption 1-131

Labeled Fat

I-13] labelled fats - triolein or free oleic acid have been useful tools

of examination of gastrotntestinal digestion and absorption in patients

Suspected of having pancreatic steatorrhea or the oalabsorption syndroae. Although blood absorpeion curves have been used extensively, in practice they

?aty be difficult to follov on ail patients since a substantial nunber of patients With good intestinal absorption may absorb rather late, and be misrepresented a3 palabsorbers if the blood curve 12 not followed long enough. For the hospitalized patience test say be run for over 10 houre if necessary but repeated numerous Venipuctures make the test less worthwhile. In the ambulatory patient it ts

hot possible to obtain samples beyond the Gch. hour for obvious reasons.

Im most Laboratories the peviod of peak value of the curve is taken as sufficient for valid results, This period falls within 4-6 hours after oral Administration of the tracer dose, It is catimated that che error for this determination within 4-0 houre my be as high as 20% for individuals with no malabsorption defects. Because of these difficulties and to avoid repeated blood sanplings over a period of many hours, a new approach was sought by Using « known physiologic function (iodide trapping by the thyroid gland) as an indicator of another physiologic funetion = (gastrointestinal absorption).

Rationale and Method - [+131 labelled fats once absorbed are metabolized and I-131 set free as fodide, This I-13] labels the iodide pool from which Zpprovinacely 1/3 4s crapped by the thyroid gland and 2/3 excreted via the ikineys in @ person with normal thyroid gland function. Regardless of the iodide trapping capacity of the thyroid gland, the fraccion of T-131 set tre from absorbed fats and accumulated by the gland vhen related co the rate of thyroid uptake of 1-13! at 24 hours wlll give information about the total I-13] absorbed from face which labelled ehe iodide pool. Thus Lf the pre-determined thyroid 24 hours uptake for 1-131 is 50%, and a capsule of I-131 labelled fat containing 100 uc is administered, and? the amount of I-131 set free from fat and trapped by the thyroid gland is 254 of the adninfstered dose of Labelled fat, it 1s evident that the Lodide pool must have contained So'uc of T-i31 set frce from fat, from which 25 ue accumulated in the thyroid Bland.

By comparing the anount of [-131 set free from absorbed fat and entering into the iodide pool to the amount admintetered the fraction absorbed can then be caleulatee:

tite 1-121 in sim Sollde ss2h 100 = 1.1131 fat abvorbed 1s

Hobie ty fe a oti at 21 fat agorbed LabeliSag

In this exanple 50 uc 1-191 were present in Lodide pool and 100 ue were adainistered, che absorption is 50%.

---Page Break---

The Use of Thyroid Trapping, ete. ~

Results: A group of 21 healthy Puerto Rico Nuclear Center employees were Investigated. Thyroid gland uptake of 1-131 at 24 hours was deverained fon all subjects. ?The mext morning after noting residual activity in the thyrold gland, @ dose of I-13] Labelle! fat was adzinistered, blood saxples were dram 3 and 5 hours later for assay anda chyroid uptake of the I-13) set free from fat wae determined 24 hours Later, Tue assumption was made for practical puryosus, that the pea of iodide crapping sccurs at or about 24 hours and that the day to day variacion is not great, (in this laboratory ?about 4 units of upcake).

26 hour radioiodine uptaie was 21% _ 1.6.

?The 24 nour radioiodine (Get free from Fat) uptake was 13.7 . 3.9.

The ratiow of I-131 from fat uptake to predetersined 1-131 chyroid
uptake te 56.6 17.9

Fat absorption - Blood curve - 4 dose per blood volume 13.42 _ 6.7.

+ This ratio tines 100 reflects the sane maguitude as thee of the
above formula.

Apa ication to patients: A group of 7 patients have becn exenined by
this technique and results correlated with blood levels at 5 hours. Four
patiente out of 17 showed low blood levels at 5 houre, but all of then

showed normal thyroid fodide levels from the I-131 set free from the absorbed
labelled fat,

The techaique can dissect out the yroup of Late absorbers from the group
of early absorbers, shen blosé. szeplye are: collected, More patients

will be examined and special application of this technique should prove
helpful in malnourished children and adults with various gastrointestinal
disorders of digestion and absorption here in the tropics.

---Page Break---

CANCER OF THE THYROLD GLAND Review of seven fatients Treated vith I-131.

The clintcal records of seven patients from the 1.C.ii. Oueclogte and University Hospitalswere reviewed to sumarize past experience Lo the treatment of thryoid carcinosa with I-1J1 during the past thece yeare.

Prior to treatment the patients had conplete clinical evaluations to determine the presence of residual chyrold tissue in the neck and netastases in bones and soft sissues. This was followed by radioisotope studies of the eck and other tissues to localize the areas with avidity for 1-131. The procedure vas carried out initially in all patter s without the benefit of Ehe thyroid stimulating hormone vhich increases the capacity of ehyrold earcinooa to cake up I-31. When the fire attempt failed to localize 1-131 containing cancer deposits, the procedure was then repeated with

the aid of the thyroid stimulating hormone.

The therapy plan consisted of the oral administration of approximately 25 mc of T-131 eo anbulatory patients, followed by clinical and radiotsotoptc exaninations at monthly or bimonthly intervals, Treatment was repeated es hecessary until all radiotsotopic evidence of active metastases disappeared. After completion of a full course of therapy, follow-up was continued every three to six sonths.

Six of the seven patients vore adults vhose average age vas 53 years, the oldest being 63. The seventh patient wax a girl Ié yeats old. One Patient was aale and six were fenale. A mase in the neck was present in six patients; the disease was confined to the neck in only one patient while Ae was widely disseminated in the other six patients. Iwo of then sad pathologic fractures of bone; two shoved lung metastases, and two had both ung and bone metastases.

Four patients received only one dose of I-131 for an average of 25 we. ALL of these four patients dicd within two years.

Three patients who are surviving received full therapeutic dose for the specific indication for waich it was administered:

(2) 13 me 1-131 given April 1961 to produce ablation of residual thyroid Eissuc in a patient with localized disease in the neck, vhose disease had been treated and controlled by surgery.

(2) 105 me T9131 given in five doses (July 1962 to February 1964) to @ 46 year old girl with bilateral clinical and pulnouary metastases caused remission of all neck manifestations and the pulmonary lesions are now diminishing.

(3) 125 me I-131 in seven doses (loveuber 1960 - Novenber 1961) given to 2 63 year old fenale vith cultiple bone and soft tissue metastases land @ pathologic fracture of the femst vas followed by remission of all radioisotopteally denonstrable metastases and healing of the fracture. A recurrence in Septeaber 1963 was treated with a dose 25M T-ist.

---Page Break---