

LEAD POISONING AND GOUT

THE POSSIBILITY THAT LEAD INTOXICATION CAN CAUSE OR PRECIPITATE GOUT CANNOT BE IGNORED. IN THE 19TH CENTURY WHEN PLUMBISM WAS RELATIVELY COMMON, ATTACKS OF GOUT OCCURRED AS A NOT INFREQUENT COMPLICATION. THE AVAILABLE DATA INDICATE, HOWEVER: ^{MAY BE}

1. GOUT ~~IS~~ A SEQUEL TO MODERATE OR SEVERE LEAD POISONING, ESPECIALLY WHEN PROLONGED.
2. PLUMBISM IS FREQUENTLY ASSOCIATED WITH "JOINT" PAIN: POSSIBLY A MANIFESTATION OF ~~PERIPHERAL~~ NERVE INVOLVEMENT, OR POSSIBLY A ^{FORERUNNER} OF GOUT.
3. THE FEW CASES OF LEAD POISONING, WITH OR WITHOUT GOUT, IN WHICH BLOOD URIC ^{LEVELS WERE} ACID ~~HAS~~ MEASURED INDICATE THAT BLOOD URATE MAY BE ELEVATED ABOVE NORMAL.
4. ALCOHOLIC INTOXICATION FROM EXCESSIVE DRINKING OR ^{EXPERIMENTAL} ADMINISTRATION OF PURE ~~ETHANOL~~ ETHANOL CAUSES AN ELEVATION IN BLOOD URATE.

IT IS REASONABLE TO ANTICIPATE THE POSSIBLE OCCURRENCE OF GOUT IN CASES OF SEVERE AND/OR PROLONGED LEAD POISONING ESPECIALLY IF THE PATIENT IS INTEMPERATE OR WHEN THE POISONING IS DUE TO THE INGESTION OF LEAD-CONTAMINATED ALCOHOLIC BEVERAGES; LEAD AND ALCOHOL MAY ACT SYNERGISTICALLY TO ~~THE~~ RAISE BLOOD URATE LEVEL. HOWEVER NO DATA WERE NOTED WHICH UNEQUIVOCALLY IMPLICATED LOW GRADE LEAD INTOXICATION AS THE CAUSE OF GOUT.

In summary, it seems possible from a review of the literature that gout and lead ^{poisoning} may be related if the following criteria are met

- ① The person has a gouty diathesis
- ② a high ~~lead~~ tissue lead level
- ③ a high alcoholic intake

Since criteria 2 & 3 may be combined in
people drinking illicitly distilled liquor where the
beverage is contaminated with lead the occurrence
of gout in drinkers of "moonshine" appears ~~entire~~
to be entirely possible.

FJ

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From Garrod - 1859 Ed. p. 256 Table -

515 cases 1st attack Gout noted at age

Age	#	Reported by Sir Sir C. SCUDAMORE
8	1 patient	
12	1	
15	1	
16	1	
17	1	
18	5	
19	3	
20-25	57	
25-30	85	
30-35	105	
35-40	89	
40-45	64	
45-50	54	
50-55	26	
55-60	12	
60-65	8	
66	2	
	<u>515</u>	

Garrod - youngest 16

"p 257ff " PATIENTS WHO INHERIT GOUT, SUFFER FROM ITS ATTACKS AT AN EARLIER AGE THAN WHEN IT IS SIMPLY ACQUIRED;" FOR EXAMPLE IN THE FRENCH TABLE PREVIOUSLY REFERRED TO, THE MEAN AGE OF THE 34 CASES OF HEREDITARY GOUT WAS 34 YEARS, THE EXTREMES BEING 13 & 60 yrs. WHEREAS IN 43 OUT OF 46 CASES OF THE ACQUIRED DISEASE, WHERE THE AGE IS NOTED, THE MEAN IS 38 yrs., the extremes BEING 27 and 50.

1st child

43 - 50 yrs

Painter ✓

Head.

NEG

Alcohol, (alcoholism) Topl.

+

PAINTERS - 55

PLUMBERS - 11

POTTERS - 4

COMPOSITOR - 4

PAPERHANGER - 1

DECORATOR - 2

PAPER STAINER - 1

79

3 FILECUTTER

82

(81)

1. RHEUM. PARENT 21 cases

1 GOUTY "

1 GOUTY "

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25 - 28

POTTER ✓

NEG

+

30 - 30

Painter ✓

NEG

+

29-30 - 30

" ✓

RHEUMATIC MOTHER

?

32 - 52

DECORATOR ✓

NEG

+

36 - 40

PAINTER ✓

NEG

+

30 - 33

" ✓

NEG

+

28 - 39

PLUMBER ✓

NEG

+

39-40 - 40

PAINTER ✓

NEG

+

31-32 - 34

" ✓

NEG

+

31 - 32

" ✓

MOTHER RHEUM.

?

39 - 40

" ✓

FATHER "

+

30-36 - 36

POTTER ✓

NEG

?

35 - 40

PAINTER:

NEG

+

30 - 37

POTTER

NEG

+

30 - 36

COMPOSITOR ✓

NEG

+

27 - 33

PAINTER ✓

NEG

+

32 - 36

" ✓

NEG

+

33 - 36

" ✓

FATHER RHEUM. GOUT

+

31 - 46

" (articulate) ✓

NEG

+

53 - 56

" " ✓

FATHER RHEUM.

NO

33 - 35

PAINTER ✓

NEG

+

27 - 33

PLUMBER ✓

NEG

+

50 - 55

PAINTER ✓

NEG

NO

30 - 35

" ✓

MOTHER GOUT

+

32 - 37

PLUMBER ✓

NEG

?

42 - 52

PAINTER ✓

NEG

NO

27 - 42

" ✓

NEG

+

8 - 28

" ✓

NEG

+

30 - 30

" ✓

NEG

+

39 - 43

" ✓

NEG

+

26 - 33

" ✓

FATHER RHEUMATIC

?

33 - 34

COMPOSITOR ✓

" "

+

48 - 51

FILE CUTTER ✓

" "

+

43 - 50

PAINTER ✓

NEG

?

35 - 45

PLUMBER ✓

NEG

+

1. RHEUM. PARENT 21 cases

1 GOUTY "

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ALBUMINURIA: 23

SPERMATOCYTES: 22; 15 albuminuria

INTERSTITIAL NEPHRITIS: 20

GL. 22 E granula kidneys: 16 INTER

2 ?

41 TENDR.

1 ?

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ALBUMINURIA: 23

SPERMATOCYTES: 22; 15 albuminuria

INTERSTITIAL NEPHRITIS: 20

GL. 22 E granula kidneys: 16 INTER

2 ?

41 TENDR.

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ALBUMINURIA: 23

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2 ?

41 TENDR.

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1 ?

TITLE OF PROJ OR STUDY-

PROJ. OR STUDY NO.

— 205 —

COPIES

61-

MAGNUS - LEVY (4) :

LORIMER, GEORGE (3b): 107 CASES OF PLUMBISM
 PO ASOC. E EAST
 27 " E ANTHRUS

CHARCOT (2): PAINTER, CHIMNEY-SWEEP

GARROD (1): OREGON - PIPE-MANER (CASTED THE METAL), 59 YRS.
MEXICONS BROTHER, SAME TRADE (DIED)
PAST: 33 of 60 PATIENTS - GOOT HAD PB POISON.

BL. URIC ACID.

1904

EVIDENCE FOR INHERITED

$$+ (\text{UPATE OF SODA})$$
 $+ (\text{URATE OF SODA})$

† IN 20 CASES

High

	Hered.	Alcoh.	Topl.
31 - 39 PLUMBER ✓ BROTHER	+	-	+
28 - 29 PAPER HANGER ✓ FATHER RHEUM.	+	-	-
24 PAINTER ✓ NEG	+	-	-
38 - 40 " ✓ NEG	+	-	-
26 - 34 " ✓ MOTHER RHEUM.	NO	-	-
47 - 53 COMPOSITOR ✓ FATHER COUNTRY	NO	-	+
46 - 57 PAINTER ✓ NEG	+	-	+
40 - 46 " ✓ MOTHER RHEUM.	+	-	+
30 - 42 " ✓ FATHER COUNTRY	NO	-	+
33 - 39 " ✓ NEG	NO	-	-
28 - 43(?) " ✓ NEG	+	-	+
44 - 48 PLUMBER ✓ FATHER COUNTRY	NO	-	+
36 - 50 PLUMBER ✓ NEG	+	-	-
38 - 39 PAINTER ✓ NEG	+	-	-
29 - 36 " ✓ MOTHER RHEUM.	+	-	-
27 - 41 " ✓ NEG	+	-	+
41-42 - 42 POTTER ✓ NEG	?	-	-
52 - 65 PAINTER ✓ MOTHER RHEUM.	?	-	-
28 - 41 " ✓ NEG	+	-	-
35-36 - 26 " ✓ NEG	+	-	-
34 - 36 " ✓ FATHER COUNTRY	+	-	+
26 - 36 " ✓ " RHEUM.	+	-	+
46 - 48 PLUMBER ✓ MOTHER COUNTRY	NO	-	?
46 - 43 PAINTER ✓ NEG	+	-	?
24-25 - 25 " ✓ NEG	?	-	?
36-37 - 34 " ✓ MOTHER RHEUMATIC	?	-	-
24 - 37 " ✓ FATHER "	+	-	?
34 - 29 " ✓ NEG	+	-	-
30 - 36 " ✓ NEG	+	-	-
42 - 43 PLUMBER ✓ NEG	?	-	-
30 - 37 FILE CUTTER ✓ FATHER RHEUM.	+	-	-
28 - 39 PAINTER ✓ NEG	+	-	-
28 - 29 PAPER STAINER ✓ FATHER COUNTRY	?	-	-
24 - 38 PAINTER ✓ NEG	NO	-	?
35 - 40 FILE CUTTER ✓ FATHER RHEUM.	?	-	+
46 - 58 COMPOSITOR ✓ MOTHER & BROTHER COUNTRY	NO	-	?
34-44 PLUMBER ✓ " RHEUMATIC	+	-	-
50 - 42 DECORATOR ✓ " "	+	-	+
27 - 40 PAINTER ✓ NEG	+	-	+
30 - 35 PLUMBER ✓ NEG	+	-	-
29 - 34 PAINTER ✓ NEG	+	-	-
35 - 53 " ✓ NEG	+	-	-
22 - 31 " ✓ NEG	+	-	-



GARROD (1) (SIR ALFRED B.)	CA. 33% CASES OF GOUT ASSOC. C PLUMBISH Pb POISONING - CASE: SUBCUTANEOUS CONCRETIONS URATE OF SODIUM (PIPE-FITTER) BROTHER (SAME TRADE) : GOUT	NOT INHERITED	GIN & BEER : GOOD BIT WHILE CASTING MUG & L
MAGNUS-LEVY (2)	36 CASES GOUT : 13 HAD Pb-POISONING 6 EXPOSED TO Pb (PRINTERS)		
1863. CHARCOT (3)	20 CASES Pb POISONING: several had arthralgia & swollen 2 cases: classical gout	NOT INHERITED	
1. THOMPSON (4)	84 CASES: 19 CHRONIC NEPHRITIS 3 DISTINCT JOINT PAINS 5 GOUT (at least 1 had tophi) not complicated by phlebotomy	1: NOT INHERITED	Free drinker

4-48 REV. 11-68

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4-48 REV. 11-68

TITLE OF PROJ. OR STUDY

PROJ. OR STUDY NO.

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SUBJECT

WORKS

SUBJECT

1906-1981, LORIMER (6)	81 PATIENTS WITH GOOT EXPOSED TO LEAD 1696 CASES OF GOOT; 772 ADMISSIONS AND/OR GOOT OR ARTHRITIC DISOR ALL 772 EXPOSED TO LEAD, MOST 5 SIGNS OF PLUMBISM	24-65		9: HAD GOOT PARENT 21: "RHEUMATIC" PARENT		+ : 33	13: ALBUMINURIA 10: INTERSTITIAL NEPHRITIS 22: GRANULAR KIDNETS	INTERFER: 54 TEMPER: 12 DUBOIS: 15 [3: INTERSTITIAL NEPHRITIS + 1: GRANULAR KIDNETS]
1914 THOMPSON (6)	5 GOOT PATIENTS OF 64 CASES OF PLUMBISM		MAN: 25 YRS	NEG. IN AT LEAST 1		+ IN AT LEAST 1		KIDNEYS: NEG. IN AT LEAST 1
1938 ROYLAND (6)	1	37	37	NEG.	0.863 Gm/L		NONE	
1938 BOWLIN + VIOLE (9)	1	66	44	6 AND FATHER + FATHER: PLUMBISM + GOOT (SAME TRADE AS PATIENT) - BROTHERS, UNCLAS, OTHER TRADES: NOT GOOT.		+	NONE	
1949 WEISSENBAACH ET AL (10)	1 AND SON OF ABOVE	57	34			+		
1957 TARA AND FRANCON (10)	2	47	37	NEG.		+	NOT MENTIONED	
1957 LUDWIG (10)	1	57	41	NEG.	0.08-0.09%	+	ESSENTIALLY NEG.	
1957 HENDERSON + INGLIS (18)	8 GOOT PATIENTS AMONG 47 WITH BRIGHT'S DISEASE OF UNKNOWN ETIOLOGY	57	57	NEG.	9.048.88 mgm %		NOT MENTIONED	
		60	CA 53	NEG.	8.0 + 8.1		ESSENTIALLY NEG.	
1962 MORDOUCHOWICZ + SLUTZKY (18)	1	28-43	14-38				ALL BRIGHT'S DISEASE	SKULL BONE Pb CONC. AVER 9.9 mgm/100 GHS bone [5.8-15.6] - CF. 12 CASES ASSOC. PLUMBISM AVE. 10.0 mgm/100 GHS bone [3.1-18.0] CF. NORMAL 3.45 mgm/100 GHS bone
1963 EMMERSON (18)	28 CASES CHRON. RENAL DISEASE: 9 of 22 WITH CHILDHOOD PLUMBISM 8 of 16 WITH Pb EXCRETION 70.6 mgm q/h EDTA HAD GOOT	50		NEG.	9.97 mgm			NOTE: 23 PATIENTS 5 Pb ASSOC. ONLY 3 HAD GOOT SKULL BONE Pb: ONLY: 9.2 mgm/100 GHS bone [6.1-11.9] 4 ONLY: 5.5 mgm/100 GHS bone [3.8-6.9]
1964 (18)	8 CASES OF GOOT + 17 CASES OF PLUMBISM + 17 CASES OF GOOT (29)	23-46	32-64	NEG.	AVER. 11.3 mgm/100 GHS bone [8.3-17.1] AVER. 9.1 [7.4-11.6]			AVER. Pb SKULL BONE mgm/100 GHS bone 8 C GOOT : 9.9 12 C PLUMBISM : 10.0 "NORMAL" : 3.45

Replaced

LEAD POISONING AND GOUT

AUTHOR(S) AND DATE OF PUBLICATION	NUMBER AND/OR PERCENT OF PATIENTS AGE	AGE(S) OF PATIENTS YRS.	AGE (YRS) AT WHICH GOUT FIRST APPEARED	EVIDENCE FOR HEREDITARY PREDISPOSITION TO GOUT	BLOOD, PLASMA, OR SERUM URIC ACID	TROPHI OR URATE DEPOSITS	EVIDENCE OF RENAL INVOLVEMENT	HIS O ALCO IND
1854, GARROD ⁽¹⁾	8 OF 47 WITH ARTICULAR DISEASE AND BLOOD URIC ACID HAD HAD LEAD EXPOSURE		25 (OR 26) TO 46 (OR 47)	+ : 4 - : 1 ?+ : 1 UNKNOWN : 2	MUCH : 7 MODERATE : 1 [THREAD EXPT.]	+ : 5 - : 1 UNKNOWN : 2	NOT MENTIONED	INTER INTER IRREG NOT NO
1863, CHARCOT ⁽²⁾	1	56	32	NEG		+		TEMP
1870, GARROD ⁽³⁾	1 ALSO BROTHER OF ABOVE	59		NEG NEG		+		INTER EARLY
1896 PACKARD ⁽⁴⁾	3 OF 9 PATIENTS WITH PLUMBISM HAD GOUT	1 40 2 38 3 48	30 36 45	NEG { MOTHER ASTHMATIC NEG MOTHER { RHEUMATISM GOUT		+ : 1 - : 1 1/4 NOT MENT : 1	ALBUMIN, CASTS	TEMP TEMP INTER INTER
1896 PACKARD ^{(4) (5)}	1 OF 48 LEAD WORKERS HAD SIGNS OF ARTICULAR GOUT	40						
1898-1899 MAGNUS-LEVY ^{(5) (6)}	OF 36 GOUTY PATIENTS 13 HAD PLUMBISM + 6 OTHERS EXPOSED TO Pb							

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ENGINEERING

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1900-1901 LORIMER ⁶	81 OF 696 CASES OF GOUT HAD LEAD POISONING.	24-65		2: HAD "GOUTY" PARENT; 21: HAD RHEUMATIC PARENT.		+ 33	13: ALBUMINURIA 10: INTERSTITIAL NEPHRITIS 22: GRANULAR KIDNEYS	54: INTERP. 12: TEMPER. 15: DOUBTFUL INTERTEMPERATE INCLUDED 80 INTERSTITIAL NEPHR. AND 16 WITH GRANULAR KIDNEYS
1914 THOMPSON ⁷	5 OF 64 PATIENTS WITH PLUMBISH HAD GOUT.		1: 25 YRS.	NEG. IN AT LEAST 1		+ IN AT LEAST 1		INTERP. 8 AT LEAST 1
1938 RAYMOND ⁸	1	37	37	NEG	0.083 GM/L		NONE	
1938 BOLLIN & VIOLE ⁹	1	66	44	NEAR RELATIVES ONLY WHEN SAME TRADE		+	NONE	
1949 WEISSENBACK ¹⁰ ET AL	1 AND HIS SON	57				+ : 2		
1957 TARA AND FRANCON ¹¹	2	47	37	NEG		+ : 2		
1957 LUDWIG ¹²	2	57	41	NEG	0.08-0.096		ESSENTIALLY NEG	
1957 HENDERSON & INGLIS ¹³	8 GOUTY PATIENTS 2 HIGH Pb CONC. SKULL BONE AMONG 47 WITH BRIGHTS D. OF UNKNOWN ETIOLOGY	28-43	14-38	NEG	9.0+8.8 mgm% 8.0, 8.1		ESSENTIALLY NEG 8: BRIGHTS D.	7 AVER. Pb CONC. SHULB BONE mgm/100 GR BONE 8-8 GOUT : 9.2 12 C PLUMBISH : 10.0 "NORMAL" : 3.4
1962 MORDECAI + SLUTZKY ¹⁴		50		NEG	9.97 mgm			
1963 EMMERSON ¹⁵	a. 9 OF 22 WITH PLUMBISH HAD GOUT b. 8 OF 16 WITH Pb EXCRETION > 0.6 mgm AFTER EDTA HAD GOUT AMONG 8 WITH CHRONIC RENAL D.	23-46 32-64			AV 11.3 [8.3-17.1] mgm/100ml AV 9.1 [7.6-11.6] mgm/100ml		6 OF 9: 9.2 4 OF 8: 5.5	
1964 RICHEL ET AL ¹⁶	3 OF 8 PATIENTS WITH PLUMBISH HAD GOUT			NEG	90-112 2.1/L	+ : 2		