plant physician can use the searches to compare the chemicals being used and produced in the plant to those he finds in his searches. He can then reassure his patient that no studies show reproductive effects from exposure to the plant chemicals, or if the lists overlap, he can ensure that adequate means are being employed to protect workers from exposure to the chemicals.

occupational mortality and cancer research. Further study of such historical research trends might assist both causal inference and the ethical evaluation of epidemiologic research.

3
AU - Magee CM
AU - Tockman MS
AU - Lees P
TI - Extrahepatic biliary atresia (EHBA) and parental farming and **pesticide** exposures.
SI - DART/T/91000599
SO - Teratology 1991 May;43(5):423
AB - Congenital EHBA, a lethal condition portending liver transplantation, is suspect for environmental teratogenesis, for lack of evident genetic factors. A large-scale, case-control study conducted the first systematic survey on parental environmental and occupational exposures. Cases (N=267) and controls with other surgical conditions of infancy (N=245), born from 1982 through 1987, were ascertained nationwide from pediatric surgeons. Mothers (98%) and fathers (87%) completed detailed questionnaires on potential exposures, family and personal health, gestational, and socioeconomic factors. The majority of factors lacked significant association (P is less than or equal to .05) with EHBA: parental age; consanguinity; health and drug history; gestation; alcohol and tobacco; breastfeeding. Associated were: mean birth rank (cases, 2.03 vs. controls, 1.78); mean number of reported 3rd trimester infections (cases, 0.27 vs. controls, 0.15). The principal case-control differences (risk increase quantified per Odds Ratio = OR) existed for **paternal** farm exposures (after logistic adjustment): ever lived on farm (OR=1.75, CI=1.16, 2.64); lived near farm, orchard (OR=2.08, CI=1.37), 3.15); worked on farm (OR=1.92, CI=1.30, 2.84); farm residence at delivery (OR=2.34, CI=1.12, 4.90); on farm during crop spraying (OR=2.03, CI=1.29, 3.19); composite farm and **pesticide** exposure (OR=2.15, CI=0.93, 4.92). Analogous maternal exposures were significant, with lower ORs. Reported **pesticide**-related defects in various mammalian species, as well as human EHBA time-space clustering, support a potential etiologic role for **pesticides**.

This iterative process could continue with further searches on specific chemicals used in the reported studies, or searches for the specific defects reported, such as extrahepatic biliary atresia or anencephaly. Other studies of these conditions may point to known mechanisms of action for chemical induction of such effects that may suggest further avenues of research for the occupational medicine physician. In his clinical setting, the

SS (2) PSTG (24)

SS 3 /C?
USER:
prt ar 1-3

PROG:

1
AU - Olshan AF
TI - Male-mediated developmental toxicity: epidemiologic evidence.
SI - DART/T/93000656
SO - Toxicologist 1993 Mar;13(1):28
AB - The potential role of **paternal** exposures in the etiology of adverse developmental outcomes in humans has not been extensively investigated by epidemiologists. However, recent epidemiologic research has begun to identify certain environmental, occupational and lifestyle exposures that may increase the risk of a variety of adverse outcomes in offspring including fetal loss, prematurity and birthweight, birth defects, and childhood cancer. In addition, two uniquely exposed cohorts, atomic bomb and childhood cancer survivors have been examined. Associations with adverse developmental outcomes have been reported for textile workers, forestry workers, painters, auto mechanics, motor vehicle drivers, firemen, sawmill workers, electronics workers, machinists, and petroleum and refinery workers. When evaluated by specific agent or class of agents, associations have been found for toluene, benzene, lead, mercury, trichloroethane, solvents, dyes, **pesticides**, cigarette smoke, and alcohol. This review will detail these epidemiologic associations and describe the potential effects of methodologic limitations.

2
AU - Levine RS
AU - Hersh CB
AU - Hodder RA
TI - Historical patterns of **pesticide** epidemiology research from 1945 to 1988 [see comments]
SI - TOXBIB/91/159563
CM - Comment in: Epidemiology 1990 Mar;1(2):97-8
SO - Epidemiology; VOL 1, ISS 2, 1990, P181-4 (REF: 65)
AB - Review of four questions faced by **pesticide** epidemiologists from 1945 to 1988 shows a transition from maternal to **paternal** concerns in Agent Orange **reproductive** research, greater emphasis on accidents than suicide in acute-injury research, and an apparent focus away from diagnoses specific to women in both

Search in progress
SS (2) PSTG (1)

[GENETOX] SS 3 /cf?
USER:
prt hits

1 - GENETOX
GTN - 457
NAME- TRICHLOROETHYLENE
RN - **79-01-6**
GENA -

o SPECIES/CELL TYPE	:	Mouse
o SEX	:	**Male**
o ASSAY TYPE	:	Sperm morphology
o ASSAY CODE	:	SPI+
o RESULTS	:	Positive
o PANEL REPORT	:	EMICBACK/50126; MUTAT RES 115:1-72,1983 **PEER REVIEWED**

(4) Finally, to access a wide range of literature on toxicology, the **TOXLINE** file could be consulted. Here a concept-oriented (rather than chemical oriented) search is conducted to find references on effects on paternal reproduction or fertility. Twenty-four citations are located, five of which came in to TOXLINE from DART, and others from a variety of subfiles used to create TOXLINE.

[GENETOX] SS 3 /cf?
USER:
file toxline

YOU ARE NOW CONNECTED TO THE TOXLINE (1981 FORWARD, NON-ROYALTY) FILE.

SS 1 /C?
USER:
(tw) all pesticid: and paternal

PROG:
SS (1) PSTG (45)

SS 2 /C?
USER:
1 and all reproduct:

PROG:

3 - DART
SI - MED/90144677
TI - **Paternal** occupation and anencephaly.
AU - Brender JD
AU - Suarez L
SO - Am J Epidemiol 1990 Mar;131(3):517-21
AB - It has been suggested that **paternal** occupational exposures to **pesticides** and solvents increase the risk of neural tube defects in offspring. With the use of Texas livebirth, fetal death, and linked livebirth-death records, the authors conducted a population-based case-control study among 1981-1986 Texas births to examine the association between **paternal** occupation and anencephalic births. Fathers employed in occupations associated with solvent exposure were more likely to have offspring with anencephaly (odds ratio (OR) = 2.53), with painters having the highest risk (OR = 3.43). A lesser association was found for fathers employed in occupations involving **pesticides** exposure (OR = 1.28). Further studies are indicated to clarify these associations.

(3) For more specific studies on possible gentoxic etiologies, the **GENE-TOX** FILE could be consulted for some of the chemicals found in the RTECS search or in the DART citations. As an example, one specific study is located in GENE-TOX for exposure of males to trichloroethane.

[DART] SS 4 /cf?
USER:
file genetox
You are now connected to the following file:

GENE-TOX
The mutagenicity data in this file have been peer reviewed.

[GENETOX] SS 1 /cf?
USER:
79-01-6

Search in progress
SS (1) PSTG (1)

[GENETOX] SS 2 /cf?
USER:
all male and 1

[DART] SS 3 /cf?
USER:
1 and 2

Search in progress
SS (3) PSTG (8)

[DART] SS 4 /cf?
USER:
prt ar 1:3 cont

1 - DART
SI - MED/90018191
TI - Self-reported exposure to **pesticides** and radiation related to pregnancy outcome--results from National Natality and Fetal Mortality Surveys.
AU - Savitz DA
AU - Whelan EA
AU - Kleckner RC
SO - Public Health Rep 1989 Sep-Oct;104(5):473-7
AB - Although fetal development is known to be sensitive to environmental agents, relatively little epidemiologic research has addressed this concern. Effects on pregnancy outcome of self-reported parental exposure to **pesticides** and to radiation were examined using data from the National Natality and Fetal Mortality Surveys, large national probability samples of live births and stillbirths occurring in 1980. In case-control analyses, maternal exposure to **pesticides** at home or work was associated with increased risk of stillbirth (odds ratios (ORs) = 1.5-1.6). **Paternal pesticides** exposure was associated with stillbirth (ORs = 1.2-1.4) and delivery of small-for-gestational-age infants (ORs = 1.4-2.0). A small increased risk of stillbirth (OR = 1.3) was found in relation to either parent's reported exposure to radiation. In spite of limitations in the quality of exposure data and the possibility of biased recall related to pregnancy outcome, associations of reported **pesticides** exposure to either parent with risk of stillbirth and small-for-gestational-age infants warrant further evaluation.

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o DOSE : 100 ppm/7H (5D male)
o EFFECT : **PATERNAL** EFFECTS (Spermatogenesis)
o REFERENCE : Natl Tech Inf Serv[PB82-185075] NTIS**)

(2) A search of the **DART** database for the terms pesticide(s) and paternal retrieves eight interesting citations.

[RTECS] SS 4 /cf?
USER:
file dart
You are now connected to the following file:

DEVELOPMENTAL AND REPRODUCTIVE TOXICOLOGY
For citations to literature published from 1950-1989, search ETICBACK.

[DART] SS 1 /cf?
USER:
all pesticide or pesticides

Search in progress

PESTICIDES APPEARS IN THE FOLLOWING FIELDS IN DART:

#	FIELD	POSTINGS
1	CIT *	16
2	TI	16
3	AB	106
4	CREL *	4
5	AD	4
6	MH	50
7	NAME	38
8	NF	40
9	MHF	49

SPECIFY NUMBERS, ALL, OR NONE-
USER:
all

SS (1) PSTG (185)

[DART] SS 2 /cf?
USER:
all paternal

Search in progress
SS (2) PSTG (166)

3 - RTECS
NAME - CARBON DISULFIDE

4 - RTECS
NAME - CARBON TETRACHLORIDE

5 - RTECS
NAME - BENZENE, NITRO-

6 - RTECS
NAME - ETHYLENE, TETRACHLORO-

7 - RTECS
NAME - ETHYLENE, TRICHLORO-

8 - RTECS
NAME - FORMALDEHYDE

9 - RTECS
NAME - ETHYLENE, CHLORO-

10 - RTECS
NAME - ETHYLENE OXIDE

[RTECS] SS 4 /cf?
USER:
prt 7 hits include cc

7 - RTECS
NAME - ETHYLENE, TRICHLORO-
RN - 79-01-6
CC - Agricultural Chemical
CC - Tumor data
CC - Drug/Therapeutic Agent
CC - Mutation data
CC - Reproductive Effect
CC - Skin/Eye Irritant
CC - Fungicide , bactericide, wood preservative
CC - Nematocide
CC - Agricultural Chemical
RSTU -
o ROUTE : inhalation
o SPECIES : mouse
o STUDY TYPE : TCLo

SCENARIO - CLINICIAN/OCCUPATIONAL MEDICINE

A worker in a plant that produces pesticides and other chemicals used in farming visits the plant physician to inquire about possible effects of exposure to these chemicals on his fertility.

(1) A search of the **RTECS** database for agricultural chemicals with reports of studies on paternal effects retrieves 97 chemical records.

USER:
file rtecs
You are now connected to the following file:

REGISTRY OF TOXIC EFFECTS CHEMICAL SUBSTANCES
Toxicity data in NIOSH's RTECS have not been critically evaluated.

[RTECS] SS 1 /cf?
USER:
(rstu) paternal

Search in progress
SS (1) PSTG (1010)

[RTECS] SS 2 /cf?
USER:
(cc) agricultural chemical

Search in progress
SS (2) PSTG (4969)

[RTECS] SS 3 /cf?
USER:
1 and 2

Search in progress
SS (3) PSTG (97)

[RTECS] SS 4 /cf?
USER:
prt 1:10 name only cont

1 - RTECS
NAME - MERCURY(II) CHLORIDE

2 - RTECS
NAME - PROPANE, 1-CHLORO-2,3-EPOXY-