What’s New Treating Warts

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Updated February 2017
We are all looking for the “magic” cure that will rid our patients of warts.

I do not have the name of that one “magic” cure.

So bear with me to explain the data and options that we do have.
The low-risk papillomaviruses

Nagayasu Egawa, John Doorbar

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ABSTRACT

Human Papillomavirus (HPV) research has been dominated by the study of Alpha papillomaviruses that together cause almost 5% of human cancers worldwide, with the focus being on the two most prominent of these (HPV16 and 18). These viruses are referred to as high-risk (HRHPV), to distinguish them from the over 200 prevalent HPV types that more commonly cause only benign epithelial lesions. The 'low-risk' (LRHPV) term used to describe this group belies their cumulative morbidity. Persistent low-risk papillomas, which occur rarely in children and adults, require regular surgical de-bulking to allow breathing. Such infections are not curable, and despite being caused by HPV11 (a LRHPV) are associated with 1–3% risk of cancer progression if not resolved. Similarly, the ubiquitous Beta HPV types, which commonly cause asymptomatic infections at cutaneous sites, can sometimes cause debilitating papillomatosis with associated cancer risk. Recurrent genital warts, which affect 1 in 200 young adults in the general population, and even the ubiquitous common warts and verrucae that most of us at some time experience cannot be reliably eradicated, with treatment strategies advancing little over the last 100 years. This review highlights molecular similarities between high and low-risk HPV types, and focuses on the different pathways that the two groups use to ensure persistent infection and adequate virus shedding from the epithelial surface. Understanding the normal patterns of viral gene expression that underlie lesion formation, and which also prevent loss of the infected basal cells in established lesions, are particularly important when considering new treatment options. Finally, the common requirement for deregulated viral gene expression and genome persistence in development of cancers, unites both high and low-risk HPV types, and when considered alongside viral protein functions, provides us with a working understanding of the mechanisms that underlie HPV-associated pathology.

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Human Papillomaviruses

- 240 distinct human and animal papillomavirus types
- 37 genera amongst all the species
  - With 5 genera (Alpha, Beta, Gamma, Mu Nu)
  - Most successful of vertebrate viruses
- Origins linked to changes in humanoid ancestors epithelium 350 million years ago.
- Found in birds, reptiles, marsupials and mammals
- Remarkable species specificity and great diversity

Egawa N et al. The low-risk papillomaviruses. Virus Research 2017
How does HPV enter the cell?

HPV entry into cells

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ARTICLE INFO

Article history:
Received 19 May 2016
Received in revised form 22 August 2016
Accepted 16 September 2016
Available online 23 September 2016

Keywords:
HPV binding entry intracellular trafficking

ABSTRACT

Human papillomavirus (HPV) is a sexually transmitted virus responsible for the development of cervical cancer, anal cancer, head and throat cancers, as well as genital area warts. A major focus of current HPV research is on preventing the virus from entering a cell and transferring its genetic material to the nucleus, thus potentially preventing the development of cancer. Although the available HPV vaccines are extremely successful, approximately 15 additional cancer-causing HPVs have been identified that the vaccines do not protect against. Therefore, roughly 150,000 cancer cases will not be prevented annually with the current vaccines. Research efforts focused on the basic cell biology of HPV infection have a goal of identifying common infectious events that may lead to inexpensive vaccines or anti-virals to prevent infection by most, if not all, HPVs. In this review we attempt to summarize what is known regarding the process of HPV binding, entry, and intracellular trafficking.

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Prevalence of Warts

- High prevalence in elementary school
- 1/3 of Dutch primary school children have cutaneous warts
- ~9.1% to 21.7% of dermatology referrals are for cutaneous wart treatment

Cell Mediated Immunity
Decreased in transplants and some syndromes

- Organ transplant patients and others with decreased CMI
- 40%+ get warts
- WHIM is an acronym for some of the characteristic symptoms of the disorder – (w)arts, (h)ypogammaglobulinemia, (i)nfections, and (m)yelokathexis.

15 yr WF Kidney Transplant

16 y WM with possible WHIM Syndrome
Covered with warts, molluscum and eczema
What is natural history of warts?

- Warts resolved in 65% of children by 2 years
- 80% within 4 years
- Regardless of treatment
- Time to resolution was not altered by wart or patient characteristics
  - Exception: childhood infections and having more than one anatomic site

Why are response rates so varied?

- Wart response rates seem to be way more complicated than we expected.
- Response rates seem to depend on many variables that are rarely if ever recorded in the studies.
  - HPV type
  - Common vs plantar warts and the number of warts
  - Age of patient
  - Length of time the wart has been present
HPV type in planter warts influences natural course and treatment response: Secondary analysis of a randomised controlled trial

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ABSTRACT

Background: Cryotherapy is effective for common warts, but for planter warts available treatments often fail.

Objectives: Within a pragmatic randomised controlled trial, we examined whether subgroups of common and plantar warts have a favourable natural course or response to treatment based on wart-associated HPV type.

Study design: Consecutive patients with new common or planter warts were recruited in 30 Dutch family practices. Patients (n=256) were randomly allocated to liquid-nitrogen cryotherapy, 40% salicylic acid self-application, or wait-and-see policy. Before treatment, swabs were taken from all separate warts and analysed by a broad-spectrum HPV genotyping assay. At 13 weeks, cure rates with 95% confidence intervals of common and plantar warts on intention to treat basis were compared between treatment arms for the different wart-associated HPV types.

Results: In total, 75% of swabs tested negative for HPV DNA and 16% contained multiple types, leaving 278 of 371 common warts (75%) and 299 of 373 plantar warts (80%) with a single type for analysis. After wait-and-see policy, cure rates were 27/30 (90%), 95% confidence interval 1-100) for HPV 2/27/57-associated common warts, 4/18 (71%, 3-16) for HPV 2/27/57-associated planter warts, and 21/36 (58%, 42-73) for HPV 1-associated planter warts. After cryotherapy, cure rates were 30/44 (86%, 5-100), 11/11 (100, 7-11) and 15/23 (65%, 45-81); after salicylic acid 16/87 (18%, 12-28), 15/60 (25%, 16-37), and 24/26 (92, 78-98), respectively.

Conclusions: HPV type influenced the natural course and response to treatment for plantar warts. HPV testing potentially optimises wart treatment in primary care.
Fig. 1. Flowchart of common and plantar warts.
Wart HPV Types

- 150 genotypically different types of HPV
- Majority of common warts types 1, 2, 4, 27, 57
- Plane warts 3, 10
Fig. 2. Comparison of cure rates (no. of warts cured at 13 weeks / no. of warts) for different treatments (Wait and see, Cryotherapy, Salicylic acid) for Common warts (HPV 2/27/57 n=201), Plantar warts (HPV 2/27/57 n=174) and Warts-associated HPV 1 (n=85). 95% confidence intervals are shown.
Natural History and HPV Type

- Probability of cure by “doing nothing” 8 times higher with HPV 1 plantar warts. About 1/3 of plantar warts have HPV 1
  - Compared to HPV types 2/27/57
    - More cures in “hands” than “feet” same method
- Conclusion: The natural resolution without treatment may depend on the HPV type of the wart
Morphological characteristics and HPV genotype predict the treatment response in cutaneous warts

Morphological characteristics and HPV genotype predict the treatment response in cutaneous warts

- 415 patients that had 611 common and 790 plantar warts
- 356 warts (from 164 pts) were genotyped

**Table 3** Distribution of human papillomavirus (HPV) types in 311 warts of 159 patients

<table>
<thead>
<tr>
<th>Sex (n, %)</th>
<th>No HPV detected (n = 18)</th>
<th>Alpha species</th>
<th>Mu species 1 (n = 26)</th>
<th>Other HPV (n = 37)</th>
<th>Multiple HPV (n = 37)</th>
<th>All patients (n = 159)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>HPV2 (n = 29)</td>
<td>HPV27 (n = 47)</td>
<td>HPV57 (n = 29)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>11 (61)</td>
<td>13 (45)</td>
<td>28 (60)</td>
<td>19 (66)</td>
<td>30 (67)</td>
<td>18 (69)</td>
</tr>
<tr>
<td>Male</td>
<td>7 (39)</td>
<td>16 (55)</td>
<td>19 (40)</td>
<td>10 (35)</td>
<td>15 (33)</td>
<td>8 (31)</td>
</tr>
<tr>
<td>Age (years), n (n)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤11</td>
<td>2 (11)</td>
<td>7 (24)</td>
<td>11 (23)</td>
<td>6 (21)</td>
<td>36 (80)</td>
<td>9 (20)</td>
</tr>
<tr>
<td>12 or older</td>
<td>16 (89)</td>
<td>22 (76)</td>
<td>36 (77)</td>
<td>23 (79)</td>
<td>9 (20)</td>
<td>14 (38)</td>
</tr>
<tr>
<td>Location (n, %)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common</td>
<td>13 (72)</td>
<td>19 (66)</td>
<td>16 (34)</td>
<td>14 (48)</td>
<td>16 (36)</td>
<td>11 (42)</td>
</tr>
<tr>
<td>Plantar</td>
<td>5 (28)</td>
<td>10 (35)</td>
<td>33 (66)</td>
<td>15 (52)</td>
<td>29 (64)</td>
<td>11 (42)</td>
</tr>
<tr>
<td>Duration (months), n (n)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0–12</td>
<td>6 (33)</td>
<td>19 (66)</td>
<td>21 (45)</td>
<td>12 (41)</td>
<td>37 (82)</td>
<td>7 (27)</td>
</tr>
<tr>
<td>13 or more</td>
<td>12 (67)</td>
<td>10 (35)</td>
<td>26 (55)</td>
<td>17 (59)</td>
<td>8 (18)</td>
<td>19 (51)</td>
</tr>
</tbody>
</table>
HPV type and response to LN2

- British group JEADV 2011 v25 p1108-1111
- Shorter infection = higher cure
- Longer infection = poor cure rate

**Human papillomavirus typing of warts and response to cryotherapy**


Department of Dermatology, West Suffolk Hospital NHS Trust, Bury St Edmunds, Division of Virology, University of Cambridge, Cambridge, Department of Dermatology, University Hospitals Coventry and Warwickshire NHS Trust, Coventry, and Department of Dermatology, Heart of England NHS Trust, Solihull, UK

**Abstract**

Culicinous warts are common and caused by a number of different types of human papillomavirus (HPV).

**Background**

Culicinous warts are common and caused by a number of different types of human papillomavirus (HPV).

**Objective**

The aim of this study was to investigate the HPV type causing common warts and to determine any association between the HPV type and the duration of warts and response to cryotherapy.

**Methods**

Eighty wart samples from 76 immunocompetent patients were taken from warts by peeling prior to cryotherapy and analysed by in situ hybridization (ISH) with probes specific to HPV 1, 2, 3, 4, 7, 10 and 37 and PCR analytes using degenerate culicinous HPV primers with subsequent DNA sequencing. Each patient’s details, including site, duration and response of the wart to cryotherapy were recorded. Cryotherapy was performed at 2 week intervals for a maximum of 12 weeks.

**Results**

An HPV type was identified in 65 samples. The majority of warts (58 samples) were typed as HPV 2/17/57 by ISH and/or PCR. Three of the 18 samples that were HPV negative with ISH were HPV positive by PCR.

Response to treatment did not correlate with HPV type, duration or location. In the 21 wart pairings taken from patients aged 16 and under, response to treatment did not correlate with HPV type but warts of shorter duration were more likely to resolve with cryotherapy treatment than longer standing lesions.

**Conclusion**

This study demonstrates that HPV type can be determined from wart pairings. HPV-2 related viruses are the prevalent HPV types causing common warts on the hands and feet in this population.

Received: 15 July 2010; Accepted: 13 October 2010
Dutch Study LN2 v Sal Acid v Nothing

- Younger age = better cure rate all branches of study
- Shorter duration of wart = ditto
- Plantar warts been there a long time = hard to cure.
- Of note:
  - \(<6\)mon doing nothing 42% cure rate plantar warts
  - \(>6\)mon doing nothing 8% cure rate plantar warts
How do treatments work anyway?

- Most common approach: damage the epithelium
  - Induces cell death
  - Probable HPV antigen exposure
  - Inducing antigen-antibody immune response

J.C. Sterling et al. BAD guidelines for cutaneous warts Brit Jnl Derm 2014;171. pp696
How do treatments work?

- Not known how much immune response contributes to wart clearance after destructive or other inflammatory treatments
- Immunosuppressed patients who do not respond to treatments suggest that immune response is essential
Why is it so difficult to clear warts?

- HPV infects basal cells and lie dormant
- HPV are non-lytic viruses
  - Only small release of virus from infected cells
  - No release of cytokines upon lysis to activate the immune sys
- Some HPV types can down-regulate class I major histocompatibility complex expression (invisibility cloak!)
  - Interferes with CMI, so HPV evades detection
- Langerhans cells not activated by HPV infection for unknown reasons
  - Might explain why contact immune therapy works

Now the body of the lecture

- Treatments
- Their cure rates…
Literature reviews...One not so minor detail...

- Numerous treatments written about singly or in combination
- Little to no evidence base for their use
- Home treatments abound
- No antivirals exist specifically for HPV
Treatment Options for Warts -1-

- Observation
- Salicylic Acid
- Cryotherapy
- Cantharidin
- Photodynamic Therapy
- Cimetidine
- Zinc
- Injected immunotherapies –
  - Candida, MMR, Trichophyton Antigen, Interferon
Treatment Options for Warts -2-

- Imiquimod
- Squaric Acid
- Diphencyprone
- Dinitrochlorobenzene
- 5-Fluorouracil
- Bleomycin
- Cidofovir
- Podophyllin Resin and Podophyllotoxin
- Sinecatechins – green tea extract
Treatment Options for Warts -3-

- Retinoids
- Silver nitrate
- Phenol
- Bichloro and Trichloro Acetic acids 25-35%
- Curretage, Cautery
- Virucidal Agents – formaldehyde and glutaraldehyde
- Duct Tape
- Complementary & Alternative Tx
- Herbal supplements

26 and counting…
What’s New Treating Warts

- Let’s look at the literature from the last decade
- Immunotherapy and Vaccines to the rescue!
  - Dr Mashiah will cover this shortly.
- Ancient cures that still work
Cantharidin

- A natural extract from cantharis vesicatoris beetles.
  - Mecoidae family of arthropods
  - Causes detachment of desmosomes
  - Subsequent blister formation
Cantharidin

• I have personally used this since 1984
• My gestalt – most warts 2-6 treatments
• Use 0.7% solution collodion base
  • Apply, dry, occlude with tape, wash off in four hours
• Painless in the office
• Does blister
• Repeat monthly

Moed L, Shwayder Tor A, Chang Mary Wu: Cantharidin Revisited.  
A blistering defense of an ancient medicine.  
Archives Dermatology 137:1357-1360  Oct 2001
Yes you can use cantharidin on the face

- Been doing it for 30+ years
- Have to do it carefully
- Never had a problem

Jahnke MN, Hwang S, Griffith JL, and Shwayder T.
Cantharidin Plus. Vs LN2 for Plantar Warts

Cantharidin–podophytoxin–salicylic acid versus cryotherapy in the treatment of plantar warts: a randomized prospective study

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Department of Dermatology, Pamukkale University, Denizli, Turkey
*Correspondence: Nida Kaçar. E-mail: n.gelino1@yahoo.com

Abstract
Background. Plantar warts are refractory to any form of treatment. High cure rates have been reported with a topical proprietary formulation consisting of 1% cantharidin, 5% podophytoxin and 30% salicylic acid (CPS). However, no data exists comparing the efficacy of this formulation with another treatment. Cryotherapy is a method that is also widely used in the treatment of plantar warts. Likewise, there is no evidence that it is more effective than any topical treatment.

Objective. We aim to compare the efficacy of topical CPS and cryotherapy in the treatment of plantar warts.

Methods. Patients with plantar warts were consecutively treated with either cryotherapy or topical CPS. Both treatments were performed every 2 weeks for up to five sessions. In patients without complete clearance, the therapy was switched to the other treatment option.

Results. Twenty-six patients with a total of 134 warts were included. Fourteen patients were completely cleared of their warts with topical CPS, whereas only in five of 12 patients (41.7%) warts were completely cleared with cryotherapy ($P = 0.001$). In seven patients without complete clearance, the therapy was switched to CPS. Four of these patients missed the follow-up. While the two of the remaining three patients were cleared of their warts, one patient's warts still failed to clear.

Conclusion. Topical CPS is more effective than cryotherapy in the treatment of plantar warts.

Received: 11 February 2011; Accepted: 29 June 2011

14/26 Cplus 54%
5/12 LN2 42%
Efficacy and Safety of Three Cryotherapy Devices for Wart Treatment: A Randomized, Controlled, Investigator-Blinded, Comparative Study

Imko Walczuk, Frank Eertmans, Bart Rossel, Agnieszka Cegielska, Eggert Stockfleth, Andre Antunes, Els Adriaens

Group from Poland, Belgium, Germany

I Walczuk, et al. Dermatol Ther (Heidelb) published online 6 Dec 2017
Home Cryo Units

- Compared
  - Nitrous Oxide device (Compound W)
  - Dimethylether Propane (Wartner) with
    - Cotton tip
    - Metal tip
Home cryo unit

- Compared side by side foam vs copper tips
- Compare the % cleared after 1-3 treatments
- Target temperature -50 °C at a depth of 4-5 mm
  - Needed for necrotic cascade to shed wart
- These devices temperature compared
  - Nitrous Oxide boiling point -87 °C
  - Dimethylether propane boiling point -57 °C
  - For comparison Liquid Nitrogen boiling point -196°C

I Walczuk, et al. Efficacy and safety of three cryotherapy devices for wart treatment
Dermatol Ther (Heidelb) published on line 6 Dec 2017
How long does it take skin to freeze with LN2?

Chapter Skin Graft Preservation by L Ge, et al. 3rd Military Medical Univ, China.
Home Cryo Units

- 80 patients
- NOTE BENE: the warts were < 6 months and <0.8cm

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Cured after X treatments</th>
<th>Not cured after three treatments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X = 1 ITT</td>
<td>X = 1 PP</td>
</tr>
<tr>
<td>Test product</td>
<td>29.3% (17/58)</td>
<td>34.0% (17/50)</td>
</tr>
<tr>
<td>Comp. 1</td>
<td>10.4% (4/39)</td>
<td>10.5% (4/38)</td>
</tr>
<tr>
<td>Comp. 2</td>
<td>12.5% (5/40)</td>
<td>13.9% (5/36)</td>
</tr>
</tbody>
</table>

70% cure rate with N2O after three treatments
48-50% cure rate with propane

I Walczuk, et al. Efficacy and safety of three cryotherapy devices for wart treatment
Dermatol Ther (Heidelb) published on line 6 Dec 2017
Lasers

- Other lasers:
  - CO2, Nd:YAG, Er:YAG, Infrared, KTP
- There are many laser studies –
- Almost all of them single case reports or small series
- None have placebo controls
- “I did it, it worked!”
Lasers

- Pulsed Dye – several studies
  - 595 nm destroys vessels under the wart
  - Possible direct thermal injury to wart virus
  - Treatment protocols vary all over the place
    - Pare down before, salicylic acid preps for 5 days, I.L. bleomycin after, etc.

- One study no difference PDL, LN2 or Cantharidin\(^1\)
- Korean study 369 patients Nd-YAG claim 96% cure rate\(^2\)
  - Level evidence 2+, Strength of recommendation C
- Study with 25 adults and 63 hand verrucae claim 76% cure rate\(^3\)

Bleomycin

- Used to treat warts for > 40 years.  
- Injected into warts 1 U/ml equivalent to 1mg/ml
  - 0.5 mg/ml or 0.1mg/ml work as well
  - Very painful – usually need local anesthesia
- Necrosis

1. Tom Lewis, E Nydorf. (both from Henry Ford Derm) J Drugs Dermatol 2006;5:499
Bleomycin

- Because of pain, injection, necrosis cannot do placebo studies
- Open studies clearance rates 20-90%\(^1\),\(^2\)
  - Partial response rates 65-85%\(^1\)
- Several studies with saline controls works well (90% v 10%)
- Several studies with LN2 half body comparisons
  - 92-97% bleo clearance vs 76-82% LN\(^2\),\(^3\),\(^4\)

>> Major side effects: Pain up to 48 hours.
Crusting, ulcers, Flagellate hyperpigmentation of torso

3. H Adalatkah et al. Dermatol Online J 2007;13;4
Something NEW

- Bleomycin with Microneedling
NEW: Bleomycin Coated Microneedles

- Pharm Res 2017 34:101-112. Han Lee et al. Korea
- Created Poly-lactic-acid (PLA) micro-needles
- Tips coated with bleomycin
- 80% dissolved in skin in vitro within 15 min
- Compared with intralesional injections
NEW: Bleomycin Coated Microneedles

Fig. 11 Optical cross-sectional images of (a) non-treated skin, (b) intralesional injection of trypan blue solution, and (c) microneedle injection of trypan blue.

Fig. 1 Diagram of locally targeted delivery of bleomycin for warts using coated microneedles: Bleomycin was delivered locally in the sub-epidermal skin layer. (a) cross-sectional diagram of warts, (b) insertion of bleomycin-coated microneedle, (c) delivery of bleomycin into the warts.

Pharm Res 2017 34:101-112. Han Lee et al. Korea
Fig. 3 Application of bleomycin microneedle patch placed on hydro-bandage to a foot wart and b hand wart. The patch was placed on a hydro-bandage and was pressed down using a force of 3 kg or more per square centimeter for 3–5 s after the hyperkeratotic surface of the wart was shaved. Then, a cohesive bandage was applied over the hydro-bandage. After 30 min, the cohesive bandage and the hydro-bandage were removed.
Bleomycin and Microneedling

- Another Korean study published on 4 Dec 2017 testing on humans
- Compared LN2 to Bleomycin Microneedling (42 pts)
- No difference at week 16 (62% vs 76% LN2)
- But Microneedling less painful
Cidofovir

- Competitively inhibits DNA polymerase
- I.V. use in immune suppressed patients
- Can be used intralesionally
- Generally used topically 1% or 3% cream
- Applied under occlusion for 5 days a week
  - Wait a week then repeat
- Single case reports, or small series
  - BAD (British Association of Dermatologists) level of evidence 3, strength D

Intralesional cidofovir for the treatment of a plantar wart

Elizabeth Moore, BA, and Carrie Kovarik, MD
Philadelphia, Pennsylvania

- 4 x 5cm plantar wart in adult patient with a history of lymphoma
- Treated with intralesional cidofovir (75 mg/ml aqueous solution), diluted at 1:3 and then 1:4
- Total of 4 injections in 2 months
- No wart present at 4 month follow-up

Treatments Dr Mashiaah will cover

- Contact allergy
- Candida injections
- Zinc
- Imiquimod
Cimetidine

- Initial case series of 34 children treated with cimetidine demonstrated promising results
- More rigorous studies failed to show the same benefit.¹
- 2007 review: “no high-quality evidence exists to support the use of cimetidine for warts
- Any benefit may lie more in the psychological aspect of treatment.”²

Bottom line – they worked about the same
What’s New 2017 Wart Treatments
Topical Glycolic Acid (Japan)

- J Hatta T Mochizuki, Kanazawa Medical Univ, Japan
- 6 cases treated with topical 35-50% Glycolic Acid
  - 4 previous Tx, 2 naïve to treatments
- Applied at home 1-3 times a day
  - Time to healing: 15, 22, 24, 25, 36, 60 weeks,
- Side effects redness, irritation, edema, crusting

LETTER TO THE EDITOR

Successful treatment of plantar warts with topical glycolic acid

J Hatta et al. Jnl of Derm 2017; 44: e134-e135
Acitretin for Recalcitrant Warts

- Alice Gottlieb’s group Boston University
- Solitary case of 33y WM “recalcitrant warts” 3-4 years
- Rx 25 mg oral acitretin and BID 40% urea cream
  - After 1 month “thinner”
  - After 4 months “near complete clearance”
  - NO FOLLOW-UP GIVEN
Isotretinoin for Warts

- 40 pt. Half oral 0.5mg/kg/d
  - Half topical tretinoin 0.05% cream
- Given for three months max.
- Oral 11/16 complete resolution (69%)
- Topical 5/13 complete resolution (38%)
- No placebo control
Next: In my clinic we call this...

- What people with poor MCAT scores do when they go into “medicine”…

“Biofields”
In the “what were they thinking” dept.

- French group to test “biofields”.
- Waving hands around the patient to ascertain their “fields”
- Finds the magic field between all the warts
- Placing a “magnetized” finger that has been energized by waving it through these fields around one wart and “pulling the field out of it”
- Can’t wait
  - for the results

Gaillard et al. TRIALS 2017, 18:263. June 2017 Caen France
Topical ionic contra-viral therapy

- Occluding Digoxin and Furosemide over the skin
- Dutch Group -- This was a first in-human “test” of the method
Topical ionic contra-viral therapy

- The theory: DNA viruses rely on K+ influx for replication
  - Both Digoxin and Furosemide inhibit K+ influx
- 12 subjects with 4+ warts on hands
- Safety assessed first: treated with fixed dose of 980 mg topical gel containing 0.125% digoxin and 0.125% furosemide for 7 consecutive days on their lower back to test safety absorption
- Then two warts treated 10 mg each and two served as negative controls

T. van der kolk et al. JEADV 2017, 31, 2088-2090
Topical ionic contra-viral therapy

- Results:
  - Well tolerated, no toxicity
  - Warts smaller at 14 days – but viral load the same.
  - I don’t think the control warts were taped
    - Occlusion affects the epidermal turnover time by itself

T van der kolk et al. JEAADV 2017, 31, 2088-2090
Microwave therapy for cutaneous human papilloma virus infection

**Background:** Human papilloma virus (HPV) infects keratinocytes of the skin and mucous membranes, and is associated with the induction of cutaneous warts and malignancy. Warts can induce significant morbidity and disability but most therapies, including cryotherapy, laser, and radiofrequency devices show low efficacy and induce discomfort through tissue destruction. Microwaves are readily capable of passing through highly keratinised skin to deliver energy and induce heating of the tissue in a highly controllable, uniform manner. **Objectives:** To determine the effects of microwave on cutaneous HPV infection. **Materials & methods:** We undertook a pilot study of microwave therapy to the skin in 32 consecutive individuals with 52 recalcitrant long-lived viral cutaneous warts. Additionally, we undertook a molecular characterisation of the effects of microwaves on the skin. **Results:** Tissue inflammation was minimal, but 75.9% of lesions cleared which compares favourably with previous studies showing a clearance rate of 23-33% for cryotherapy or salicylic acid. We show that microwaves specifically induce dendritic cell cross-presentation of HPV antigen to CD8+ T cells and suggest that IL-6 may be important for DC IRF1 and IRF4 modulation to enhance this process. **Conclusion:** Keratinocyte-skin dendritic cell cross-talk is integral to host defence against HPV infections, and this pilot study supports the concept of microwave induction of anti-HPV immunity which offers a promising approach for treatment of HPV-induced viral warts and potentially HPV-related cancers.

**Key words:** warts, microwave, CD8+ T cells, HPV
Microwave for HPV.
Eur J Dermatol 2017;27(5):511-8

- Pilot study in 32 consecutive pts with 52 “recalcitrant” warts
- English dermatology and podiatry center
- Also looked at tissue effects via biopsies
Microwave for HPV.
Eur J Dermatol 2017;27(5):511-8

- THEORY:
- Microwave induced dendritic cell cross presentation of HPV antigen to CD8+ T cells. IL-6 important in the action
- Microwave pilot study possibly induces anti-HPV immunity
- Tissue inflammation minimal
- 76% lesions cleared
Microwave for HPV.
Eur J Dermatol 2017;27(5):511-8

- Study criteria: Adult,
  - >1y duration wart, mean 60.54 months
  - Min 2 modalities tried
- 22-71 y old. 16 solitary warts. 38 mosaic
- Microwave “Swift” from Emblation Medical UK
  - 50 J (10W at 5 s) over a 7 mm application
  - Warts >7mm received mult applications till all covered
  - Treated at week 1, month 1, month 3, month 12
  - Response was “Resolved” or “Not resolved”
- No placebo control
Microwave for HPV.
Eur J Dermatol 2017;27(5):511-8

- Short treatment time (5 sec)
- Some pain (one adult withdrew)
  - Topical EMLA did not mitigate the pain
- No bandages required
- Within 5 sec, microwave penetrate 3.5 mm
- Beam travels straight from the tip – little defraction
- Heats up water and its surrounding tissue
- No vapor, no plume
The Successful Use of a Novel Microwave Device in the Treatment of a Plantar Wart

Ivan Robert Bristow, Christopher Webb, Michael Roger Ardern-Jones

Faculty of Health Sciences, University of Southampton, Southampton, UK;
The Podiatry Centre, Portsmouth, UK; Faculty of Medicine, University of Southampton, Southampton, UK; Department of Dermatology, University Hospitals Southampton NHS Foundation Trust, Southampton, UK

Fig. 2. Lesion at 3 weeks after treatment.

Fig. 3. Lesion at 5 weeks following 2 treatments.

Before treatment

3 weeks
After 1 tx

5 weeks
After 2 tx
Endwarts Pen

- Topical Formic Acid
Formic Acid to treat Warts

- Formic acid naturally occurs in Fire Ants and Stinging Nettles
- Produced in Italy called “Endwarts pen” 85% Formic Acid
- Letter to Editor Int Jnl Dermatology from a Milanese Group
- Pen applied to each wart 30 seconds Biweek x 6 weeks
- 23 patients who had been treated elsewhere multiple times with other modalities
- They had 42% cure rate of the common warts
- No controls

Special Section added this year 2018

- Condyloma in children
- Is it sexual abuse or innocent?
- Treatment options…
Anal Genital Warts in Children

Which if these kids do you report to child services? Both? Neither? How do you tell?
Anogenital Warts in Children

Clinical and Virologic Evaluation for Sexual Abuse
Bernard A. Cohen, MD, Paul Hong, MD, Elliot Androphy, MD

- Seventy-three children with anogenital warts were examined for sexual abuse during a 2-y period. Our data suggest that nonsexual transmission is common, particularly in children under 3 y of age. Approximately 25% of these children were younger than age 1 y, and another 50% were between the ages of 1 and 3 y. No evidence of sexual abuse was detected in 63 children. (Arch Dermatol. 1999;135:1575-1580)

MATERIALS AND METHODS
All patients with anogenital warts referred to the Department of Pediatric Dermatology at the Children's Hospital of Pittsburgh (PA) and the Children's Hospital of Philadelphia (PA) were entered into our series at the time of diagnosis. Anogenital warts were defined clinically as any verrucous

- B Cohen, Arch Derm 1999
- 73 examined for childhood sexual abuse over 2 y period
- 66/73 patients warts innocently acquired
- Nonsexual transmission common <3 y
Anogenital Warts in Children

Anogenital Human Papillomavirus in Sexually Abused and Nonabused Children: A Multicenter Study

WHAT’S KNOWN ON THIS SUBJECT: Interpreting human papillomavirus (HPV) detection in children as evidence of child sexual abuse (CSA) is controversial, because little is known about the epidemiology of HPV in children.

WHAT THIS STUDY ADDS: A multicenter study was undertaken in those presenting for evaluation for CSA to compare HPV prevalence by CSA certainty, maternal and child history of genital and other warts, and demographic factors.

abstract

- E Unger et al. Pediatrics 126, 3 Sept 2011
- Anogenital HPV in sexually abused and nonabused children.
HPV in sexually abused and nonabused children

- 8 sites across America
- Kids presented for Child Sexual Abuse
- 576 kids. Six months to 13 years
- Abuse possibility “graded”
  - Definite, probable, possible, no evidence

E Unger et al. Pediatrics 126,3 Sept 2011
HPV in Abused vs Not Abused -2

- HPV more likely in Abused (13.7%)
  - Definite, Probable, Possible
- HPV less likely in not abused (1.3%)
  - No evidence of abuse
  - Age 10y+ prevalence HPV 20.6%
  - Age < 10y prevalence HPV 5.6%
- **CONCLUSIONS:** HPV detection was associated with childhood sexual abuse and increased incidence with CSA certainty.
  - In this population, genital HPV seemed to behave as a sexually transmitted infection.

E Unger et al. Pediatrics 126,3 Sept 2011
Anogenital Warts (AGW) in Children

- In adults, AGW are acquired through sexual transmission and most adults have been exposed to and carry subclinical HPV.
- In children four mechanisms have been proposed: vertical transmission from
  - An infected mother,
  - Autoinoculation from non-genital warts
  - Heteroinoculation (contact between the anogenital region and infected second party or contaminated objects/surfaces)
  - Sexual
- Currently evidence only exists for perinatal or sexual transmission.
AGW in children and abuse

- Five studies have reported anogenital warts in less than 3.2% of sexually abused children.
- Seven studies have reported sexual transmission to be the cause of infection in 31% to 58% of children with anogenital warts.
- Two small studies have shown that anogenital warts in young children have been sexually transmitted even in the presence of maternal infection.
- Older children are more likely to have sexual transmission confirmed or proven.
AGW and abuse in Children

- There is a lack of evidence to support a cut-off age below which vertical transmission can be assumed to occur.
- The evidence base does not help to clarify whether HPV typing is of value in the diagnosis of sexual abuse.
- One study has shown HPV detection to be associated with sexual abuse and HPV detection increases with security of sexual abuse certainty.
Warts in Children and Abuse

- Chris Hobbs (Leeds UK)
  - Assumes all anal warts are sexual acquired until otherwise proved
- Buddy Cohen (Johns Hopkins USA)
  - Published articles: most are innocent
- Tor Shwayder (Detroit Mi USA)
  - I look hard for other signs of CSA
  - I interview the care givers
  - I report only those that raise red flags
Is there any consensus on wart treatments?

- Cochran Reviews
- Consensus statement
- Institutional retrospective reviews
- Single author suggestions

We are in the final stretch of the lecture now…
Review of Treatments

Efficacy of topical treatments for cutaneous warts: a meta-analysis and pooled analysis of randomized controlled trials

C.S. Kwok, R. Holland and S. Gibbs*

School of Medicine, Health Policy and Practice, University of East Anglia, Norwich NR4 7TJ, U.K.
*Dermatology Department, Swindon Hospital, Swindon, Wiltshire, U.K.

- BJD 2011 v165, p233-246
- Efficacy of topical treatments for cutaneous warts: a meta-analysis and pooled analysis of randomized controlled trials
- C.S.Kwok et al. United Kingdom
<table>
<thead>
<tr>
<th>Reference</th>
<th>No. of participants (FT)</th>
<th>Interventions</th>
<th>Follow-up/evaluation period</th>
<th>Inclusion criteria</th>
<th>Trial quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sharpie et al.</td>
<td>77 (60)</td>
<td>Zinc sulphate, high dose vs. low dose vs. placebo</td>
<td>3 weeks, 6 weeks and 8 months</td>
<td>Adults and children with ordinary warts</td>
<td>Low</td>
</tr>
<tr>
<td>Somers and Campbell</td>
<td>31</td>
<td>Cryotherapy high (aggressive) vs. low (gentle) dose</td>
<td>4 weeks</td>
<td>Adults, refractory warts of hands and feet</td>
<td>Low</td>
</tr>
<tr>
<td>Sparrow et al.</td>
<td>40</td>
<td>Krypton vs. SA vs. no treatment vs. placebo</td>
<td>6 weeks</td>
<td>Adults, warts of hands and feet</td>
<td>Medium</td>
</tr>
<tr>
<td>Saldai et al.</td>
<td>121 (149)</td>
<td>PDT vs. placebo</td>
<td>8 weeks</td>
<td>Adults and children, ordinary warts of hands and feet</td>
<td>Low</td>
</tr>
<tr>
<td>Snelde and Irwin</td>
<td>183 (202)</td>
<td>SA vs. cryotherapy vs. both</td>
<td>8 weeks and 6 months</td>
<td>Adults and children, ordinary warts of hands and feet</td>
<td>Low</td>
</tr>
<tr>
<td>Snelde et al.</td>
<td>57</td>
<td>SA vs. placebo</td>
<td>8 weeks and 6 months</td>
<td>Adults and children, ordinary warts of hands and feet</td>
<td>High</td>
</tr>
<tr>
<td>Sonder et al.</td>
<td>30 (250 warts)</td>
<td>PDT-W × 1 vs. PDT-W × 3 vs. PDT-B × 3 vs. PDT-B × 1 vs. 5-methylcytosine</td>
<td>8 weeks</td>
<td>Adults, refractory warts of hands and feet</td>
<td>Medium</td>
</tr>
<tr>
<td>Sonder et al.</td>
<td>139 (95, 312 warts)</td>
<td>PDT vs. placebo</td>
<td>8 weeks</td>
<td>Adults, refractory warts of hands and feet</td>
<td>Medium</td>
</tr>
<tr>
<td>Vallet et al.</td>
<td>75 (575 warts)</td>
<td>Celsior vs. treatment 3-week interval</td>
<td>12 weeks</td>
<td>Adults, warts of feet only</td>
<td>Low</td>
</tr>
<tr>
<td>Vance et al.</td>
<td>100 (123)</td>
<td>INF-α high vs. low vs. placebo</td>
<td>12 weeks</td>
<td>Adults, refractory warts of hands and feet</td>
<td>Low</td>
</tr>
<tr>
<td>Vamos et al.</td>
<td>42 (51)</td>
<td>INF-α vs. placebo</td>
<td>24 weeks</td>
<td>Adults and children, refractory warts of hands and feet</td>
<td>Low</td>
</tr>
<tr>
<td>Veron et al.</td>
<td>24</td>
<td>PDT vs. placebo</td>
<td>8 weeks</td>
<td>Adults and children, warts of foot only</td>
<td>Medium</td>
</tr>
<tr>
<td>Wang et al.</td>
<td>120 (250)</td>
<td>Prometin 9 occlusion vs. prometin 17 weeks</td>
<td>Adults and children, ordinary warts of hands and feet</td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Wang et al.</td>
<td>136</td>
<td>Chinese herb + metronidazole vs. metronidazole</td>
<td>3 treatments</td>
<td>Adults and children, ordinary warts of hands and feet</td>
<td>Low</td>
</tr>
<tr>
<td>Werner et al.</td>
<td>80 (90)</td>
<td>Duct tape vs. molexial pads</td>
<td>Baseline, 1 and 2 months</td>
<td>Adults with warts</td>
<td>High</td>
</tr>
<tr>
<td>Wilson et al.</td>
<td>90</td>
<td>DPCP vs. cryotherapy vs. placebo</td>
<td>4 months</td>
<td>Adults, ordinary warts of hands only</td>
<td>Low</td>
</tr>
<tr>
<td>Wolf et al.</td>
<td>22</td>
<td>5-FU/SA vs. placebo</td>
<td>4 weeks</td>
<td>Adults and children, ordinary warts of hands and feet</td>
<td>Low</td>
</tr>
<tr>
<td>Wu et al.</td>
<td>14 (20)</td>
<td>Qu Yunn Drug vs. placebo</td>
<td>1 and 2 weeks</td>
<td>Adults with warts</td>
<td>Low</td>
</tr>
<tr>
<td>Yard et al.</td>
<td>34 (40)</td>
<td>5-FU vs. placebo</td>
<td>1 and 6 months</td>
<td>Adults with warts, not feet or periangual</td>
<td>Low</td>
</tr>
<tr>
<td>Zhang et al.</td>
<td>187</td>
<td>Chinese herb vs. electrosurgery knife</td>
<td>Three courses of Chinese herb, total of 30 days</td>
<td>Ordinary warts of feet</td>
<td>Low</td>
</tr>
</tbody>
</table>

5:ALA, 5-aminolevulinic acid; 5-FU, 5-fluorouracil; DMAP, dimethylamine propanediol; DNFB, dinitrochlorobenzene; INF, interferon; IA, imiquimod; PDT, photodynamic therapy; PDT-B, PDT with blue light; PDT-R, PDT with red light; PDT-W, PDT with white light; SA, salicylic acid; VB, volatile bulb; wRA, water-filtered red A.
Table 2 (Continued)

<table>
<thead>
<tr>
<th>Reference</th>
<th>Control group</th>
<th>Cure rate (%)</th>
<th>Intervention group</th>
<th>Cure rate (%)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hayes and O’Keeffe 20</td>
<td>Low-dose bleomycin</td>
<td>11/15 (73)</td>
<td>Bleomycin: medium-dose; high-dose</td>
<td>21/24 (88); 9/10 (90)</td>
<td>Warts is unit of analysis</td>
</tr>
<tr>
<td>Herr et al. 27</td>
<td>Placebo (alone)</td>
<td>13/61 (21)</td>
<td>Antimicrob.; IFN-α + antimicrob.; IFN-α</td>
<td>23/48 (55); 28/45 (65); 12/44 (25)</td>
<td>ITT</td>
</tr>
<tr>
<td>Stahl et al. 21</td>
<td>SA/uracil</td>
<td>1/7/5 (11)</td>
<td>PDT</td>
<td>5/15 (7)</td>
<td>ITT</td>
</tr>
<tr>
<td>Seed and Brind 20</td>
<td>SA/IA</td>
<td>17/10 (63)</td>
<td>Cryotherapy; SA/IA/epoxytherapy</td>
<td>44/46 (61); 47/64 (75)</td>
<td>ITT</td>
</tr>
<tr>
<td>Steele 25</td>
<td>Placebo</td>
<td>15/28 (64)</td>
<td>Methylcholanthrene+IAA</td>
<td>24/29 (85)</td>
<td>ITT</td>
</tr>
<tr>
<td>Sorensen et al. 52</td>
<td>Cryotherapy</td>
<td>15%</td>
<td>PDT-V6 x 1; PDT-V4 x 1; PDT-R</td>
<td>73%; 74%; 78%</td>
<td>Warts is unit of analysis, LA study</td>
</tr>
<tr>
<td>Steimer et al. 54</td>
<td>Placebo</td>
<td>47/133 (12)</td>
<td>PDT</td>
<td>64/144 (46)</td>
<td>Warts is unit of analysis, LA study</td>
</tr>
<tr>
<td>Vali and Jendrejko 67</td>
<td>Trimeton</td>
<td>39/155 (25)</td>
<td>Cure acid</td>
<td>94/390 (65)</td>
<td>Warts is unit of analysis, LA study</td>
</tr>
<tr>
<td>Vanee et al. 20</td>
<td>Placebo</td>
<td>2/18 (11)</td>
<td>IFN-α low-dose; high-dose</td>
<td>1/2 (12); 1/2 (12)</td>
<td>–</td>
</tr>
<tr>
<td>Vank Aaron et al. 11</td>
<td>Placebo</td>
<td>11/25 (44)</td>
<td>IFN-α</td>
<td>12/26 (46)</td>
<td>ITT</td>
</tr>
<tr>
<td>Vepsa and Jendrejko 67</td>
<td>Placebo</td>
<td>18/33 (55)</td>
<td>PDT</td>
<td>18/37 (51)</td>
<td>–</td>
</tr>
<tr>
<td>Vepsa et al. 67</td>
<td>SA/IA without</td>
<td>45%</td>
<td>SA/IA without epithelialisation</td>
<td>45%</td>
<td>–</td>
</tr>
<tr>
<td>Wang et al. 51</td>
<td>Retinoid acid</td>
<td>29/58 (52)</td>
<td>Clostridium hirae + retinoid acid</td>
<td>5/7 (0)</td>
<td>–</td>
</tr>
<tr>
<td>Weener et al. 70</td>
<td>Mofidiad</td>
<td>3/8 (39)</td>
<td>Bacteriophage</td>
<td>1/6 (16)</td>
<td>ITT</td>
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<tr>
<td>Wilson 75</td>
<td>Placebo</td>
<td>1/5 (20)</td>
<td>DNCB, cryotherapy</td>
<td>1/10 (10); 1/6 (16)</td>
<td>–</td>
</tr>
<tr>
<td>Wollff 75</td>
<td>Placebo</td>
<td>5/21 (53)</td>
<td>5-FU/SA</td>
<td>12/12 (67)</td>
<td>L/R study</td>
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<tr>
<td>Wex et al. 78</td>
<td>Picric-acid</td>
<td>3/10 (30)</td>
<td>Quinacrine</td>
<td>2/10 (20)</td>
<td>–</td>
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<tr>
<td>Wazzalat et al. 77</td>
<td>Placebo</td>
<td>1/34 (35)</td>
<td>5-FU</td>
<td>22/54 (65)</td>
<td>L/R study</td>
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<tr>
<td>Zhang 78</td>
<td>Electro-surgery knife</td>
<td>7/7 (100)</td>
<td>Clostridium hirae</td>
<td>5/7 (0)</td>
<td>–</td>
</tr>
</tbody>
</table>

FJU, (U= 1;2-nitrosoazo; DIME, dithranol) other: propion; DNCB, dimethyl benzene; IFN, interferon; LA, lactic acid; PDT, photodynamic therapy; PDT-R, PDT with red light; PDT-W, PDT with white light; TA, salicylic acid; VB, vitamin B6; UVR, uveal infra-red A.
<table>
<thead>
<tr>
<th>Treatment</th>
<th>No. of trials</th>
<th>Cure</th>
<th>Total</th>
<th>Mean % cure</th>
<th>Range, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placebo</td>
<td>27</td>
<td>189</td>
<td>830</td>
<td>23</td>
<td>5–73</td>
</tr>
<tr>
<td>SA</td>
<td>16</td>
<td>421</td>
<td>813</td>
<td>52</td>
<td>0–87</td>
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<tr>
<td>Cryotherapy</td>
<td>17</td>
<td>337</td>
<td>692</td>
<td>49</td>
<td>0–69</td>
</tr>
<tr>
<td>Aggressive cryotherapy</td>
<td>4</td>
<td>100</td>
<td>184</td>
<td>54</td>
<td>45–73</td>
</tr>
<tr>
<td>Cryotherapy/SA</td>
<td>3</td>
<td>181</td>
<td>312</td>
<td>58</td>
<td>38–78</td>
</tr>
<tr>
<td>Duct tape</td>
<td>3</td>
<td>38</td>
<td>125</td>
<td>30</td>
<td>16–73</td>
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<td>Bleomycin</td>
<td>3</td>
<td>65</td>
<td>72</td>
<td>90</td>
<td>86–100</td>
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<tr>
<td>Topical 5-FU</td>
<td>3</td>
<td>67</td>
<td>129</td>
<td>52</td>
<td>44–85</td>
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<tr>
<td>Intralesional 5-FU</td>
<td>1</td>
<td>22</td>
<td>34</td>
<td>65</td>
<td>65</td>
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<tr>
<td>DNCB</td>
<td>2</td>
<td>32</td>
<td>40</td>
<td>80</td>
<td>80</td>
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<tr>
<td>IFN-α</td>
<td>4</td>
<td>37</td>
<td>140</td>
<td>26</td>
<td>18–50</td>
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<td>IFN-β</td>
<td>1</td>
<td>42</td>
<td>80</td>
<td>53</td>
<td>53</td>
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<tr>
<td>IFN-γ</td>
<td>1</td>
<td>35</td>
<td>89</td>
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<td>PDT</td>
<td>3</td>
<td>15</td>
<td>122</td>
<td>12</td>
<td>0–37</td>
</tr>
</tbody>
</table>

SA, salicylic acid; 5-FU, 5-fluorouracil; DNCB, dinitrochlorobenzene; IFN, interferon; PDT, photodynamic therapy.
BJD Review of treatment, 2011

- Pooled analysis cure rate:
- Placebo trials 23% (5-73%)
- Salicylic acid trials 52% (0-87%)
- Cryotherapy trials 49% (0-69%)
- Aggressive cryotherapy 54% (45-75%)
- Combined cryo and salicylic acid 58% (38-78%)
BJD Review of treatment, 2011

- Salicylic Acid > placebo (CI 1.15-2.24)
- Aggressive cryotherapy > gentle cryotherapy (CI 1.20-3.52)
- Cryotherapy = placebo (CI 0.27-2.92)
- Cryo + Salicylic Acid > either one alone

- Wait did I see that right? Cryo is same as placebo?
Problems with these trials?
- Many trials small and lack allocation concealment or blinding of outcome assessments
- Intention-to-treat (ITT) principles often not used
- No single therapy proven effective complete remission in every patient
- This study used ITT – highest quality form of analysis
  - Yielded 77 relevant studies
3 years later: A BAD Consensus Statement

- British Association of Dermatologists’ guidelines for the management of cutaneous warts 2014
- Brit Jnl Derm 2014; 371, 696-712
Conclusions - Salicylic Acid
Brit Assoc Derm Guidelines 2014

- Salicylic Acid
- Most common preparation
- Exfoliates cells
- Higher concentrations – irritant
  - ?Stimulate host immunity
  - Paints 10-26%
    - +/- lactic acid
  - Plasters 40%
  - Ointments 50%+
Conclusions - Salicylic Acid
Brit Assoc Derm Guidelines 2014

- Downside of Salicylic Acid:
- Patient expectation of cure from SA paint is low
- Irritation of surrounding skin a negative
- Care should be taken if neuropathic feet (diabetics)
- Takes many weeks to months to effect a cure
  - Compliance is poor

- Cryospray equal to cotton bud application
- Reported cure rate all studies: 0% to 49%
  - Hand warts > Foot warts
  - Better cure rates when pared with salicylic acid
- More aggressive seem to be better than gentle freeze
  - Longer freeze (10second) (study high drop out rate)$^1,^2$
  - Double freeze-thaw cycles (study high drop out rate)$^2$
- Data all over the map, not very high quality
  - Increased risk of pain, blister, scarring

Conclusions- Liquid Nitrogen -3- Brit Assoc Derm Guidelines 2014

- Interval
  - q2-3 weeks was a little better than q4 weeks at 3 months\(^1,2,3\)
  - Data equalized at 6 months
- Persistent warts?
  - Q 3 weeks for three months if no better – stop! \(^4\)

3. P Larsen J Dermatolog Treat 1996;7.29
4. J Berth-Jones, BJD 1992;127.262
Conclusions
Brit Assoc Derm Guidelines 2014

- Evidence based treatment is weak overall
- Many flawed study designs
- Future better studies
  - Separate children and adults
  - Duration of warts before the study commences is recorded
  - Study group adequate size
  - Treatment runs for up to six months
  - Left vs Right studies avoided
  - Treatment success measured as clearance of all treated warts
  - Recurrence at 3 and 6 months after treatment included
Conclusions
Brit Assoc Derm Guidelines 2014

- Plantar warts – no treatments have been convincingly and consistently effective
Risk of wart relapse after treatment is 5 times more if smoker
Keep your eyes on these new modalities

- Bleomycin and microneedling
- Microwave treatment of warts
My last thoughts...

- Hope you enjoyed this condensed version of my wart lecture
- Hope it gave you some treatment ideas
- Hope it gave you an understanding of the complexities of this issue
- If you decide to do your own study in the future please
  - Type the HPV if possible before you begin
  - Note where the warts are located on the body
    - their duration
    - the patients age
  - Have a ‘non treatment’ control
The End

- Please do not forget to fill out your evaluations (on line)
- We try to make these lectures better every year
- We need your input to do this.
- Be helpful, kind and specific.