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The Consequences of Habitual Knuckle Cracking

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Habitual knuckle cracking in children has been considered a cause of arthritis. A survey of a geriatric patient population with a history of knuckle cracking failed to show a correlation between knuckle cracking and degenerative changes of the metacarpal phalangeal joints.

MANIPULATING THE metacarpal-phalangeal (MCP) joints and sometimes the proximal interphalangeal (PIP) joints in such a manner as to produce an audible popping or cracking sound is a commonly observed childhood habit not infrequently persisting into adult life. Unsworth, Dowson and Wright have recently shown that the cracking sound can be explained by a collapse of synovial fluid vapor cavities that result from the negative pressure induced by MCP joint distraction.[1] Although knuckle cracking (KC) appears to cause some comfort or satisfaction to the person doing it, the apparent traumatic component dramatized by the popping sound suggests to many people that joint disorders and specifically arthritis would be an inevitable outcome.[1] As a consequence, many children with this habit are chided to stop cracking their knuckles lest arthritis or enlarged knuckles or both develop. In light of the relative rarity of MCP osteoarthritis and in view of the apparently common prevalency of habitual knuckle cracking it was decided that a correlation of MCP osteoarthritic changes in a geriatric population with a history of KC would be of interest.[2-7]

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Materials and Methods

Twenty-eight patients (residents of a Jewish home for the aged) who were able to recall whether or not they cracked knuckles (and in the case of a positive response were able to demonstrate a KC maneuver) were examined clinically and by x-ray. Traumatic arthritis other than that which might be associated with KC, rheumatoid arthritis, gout, chondrocalcinosis and hemachromatosis cases were excluded. Standard anteroposterior radiographs of the hands were studied. The patient population consisted of 28 persons, with an average age of 78.5 years, of whom 23 were women and 5 were men. The patients were unselected except for their ability to clearly recall whether or not they had been knuckle crackers and their agreement to have an x-ray study of the hands done for the purposes of this study. A population of 28 school children at a summer camp, with an average age of 11 years, consisting of 8

ABBREVIATIONS USED IN TEXT
DIP = distal interphalangeal
DJD = degenerative joint disease
KC = knuckle cracking
MCP = metacarpal-phalangeal
PIP = proximal interphalangeal

girls and 20 boys was surveyed in an effort to assess the prevalence of KC in a younger population group.

Results

For the purposes of this study which was designed to detect bony enlargement and degenerative arthritis in the MCP joints, radiographically identifiable osteophytes were required for the diagnosis of MCP degenerative joint disease (DJD). Only one patient with a history of KC showed MCP DJD compared with 14 knuckle crackers who showed no changes (see Table 1). MCP osteophytes were observed in five patients who had no history of KC. Eight additional patients who were not knuckle crackers had normal MCP joints. Analysis of the data reveals a negative correlation between KC and MCP DJD in the geriatric population studied ($P = 0.06$). Further analysis of this population group for possible sex bias indicated that of the women patients studied, one of 11 KC positive women had MCP DJD while five of 12 KC negative women had MCP DJD. There was a lack of a positive correlation of KC in the women with MCP DJD ($P = 0.10$). Four of the five men gave a history of KC, but MCP DJD was not noted in any of them.

Table 2 indicates the correlation of KC prevalence in two age populations. The data suggest that the prevalence of KC in geriatric men was not different from that of the 11-year-old boys ($P = 0.14$) and that the same observations appear to be applicable to the females with a lesser degree of certainty indicated by a P value of 0.24.

Table 3 shows that when radiographic correlations of the MCP DJD with proximal interphalangeal (PIP) DJD were made, PIP DJD was present in all six of the cases with demonstrable MCP DJD. Only eight of the 13 cases without MCP DJD had PIP DJD. There was therefore a high correlation of MCP DJD with PIP DJD ($P = 0.01$). Additionally, in five of the six patients with PIP osteophytes, typical distal interphalangeal (DIP) osteophytes were seen on the anteroposterior roentgenograms of the hands.

TABLE 1.—*Correlation of Knuckle Cracking (KC) with Metacarpal-Phalangeal (MCP) Degenerative Joint Disease (DJD)* in a Geriatric Population (Average Age 78.5 Years)*

	KC Yes (+)	KC No (−)	Total
MCP DJD(+)	1	5	6
MCP DJD(−)	14	8	22
TOTAL	15	13	28

*DJD for the purpose of this study is defined as a roentgenographically identifiable osteophyte on a standard anteroposterior view.

TABLE 2.—*Correlation of Knuckle Cracking (KC) Prevalence in Two Age Groups*

	Female Average Age		Male Average Age	
	81.4	11	76.0	11
KC Yes(+)	11	2	4	8
KC No(−)	12	6	1	12
TOTAL	23	8	5	20

TABLE 3.—*Correlation of Metacarpal-Phalangeal (MCP) Degenerative Joint Disease (DJD) and Proximal Interphalangeal (PIP) DJD*

PIP DJD	MCP DJD Present	MCP DJD Absent
Present	6	8
Absent	0	13

All six cases with MCP DJD had PIP DJD, but only 8 of 13 cases without MCP DJD had PIP DJD. MCP DJD correlates with PIP DJD ($P = .01$). Five out of six patients with PIP osteophytes had typical distal interphalangeal (DIP) osteophytes on the A-P hand roentgenograms.

Discussion

Analysis of the prevalence of KC in the geriatric population when compared with a group of 11-year-old youngsters suggests that the prevalence of KC in the geriatric population that was studied was not significantly different from what one observes in a youthful population susceptible to habitual quirks and mannerisms. The proportionately greater prevalence of KC in the geriatric patients apparently reflects a selection factor inherent in the study design. Only those geriatric patients who could recall specifically if they did or did not crack their knuckles were entered into the study. Although no records were kept, a considerable number of patients in this age population were unable to remember with certainty whether or not they cracked their knuckles. It seems likely that those geriatric patients who did not crack their knuckles in childhood would have more uncertainty when questioned and the bias of patient

selection would be to include a higher proportion of knuckle crackers.

The failure to positively correlate degenerative changes in the MCP joints in the patients who described habitual KC was of great interest. The observation that in all of the patients with MCP DJD, whether or not they were knuckle crackers, there was radiographic evidence of PIP DJD and in five of those six there was radiographically demonstrable DIP osteoarthritis on standard anteroposterior views of the hands (in all six of these patients, Heberden's nodes were present clinically) strongly suggests that MCP DJD is a function of whatever the predisposing factors are to osteoarthritis involving the distal interphalangeal and proximal interphalangeal joints and that MCP DJD is not a consequence of knuckle cracking.

Conclusion

The data fail to support evidence that knuckle cracking leads to degenerative changes in the metacarpal phalangeal joints in old age. The chief morbid consequence of knuckle cracking would appear to be its annoying effect on the observer.

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