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HYDROXYCHLOROQUINE IMPROVES THE BLOOD LIPID PROFILE IN RA AND SLE:
AN INTERVENTION STUDY

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Background

Cardiovascular comorbidity is increased in rheumatoid arthritis (RA) and in systemic lupus erythematosus (SLE). In both RA and SLE, retrospective studies have shown an association between treatment with chloroquine and a positive impact on cardiovascular risk factors. However, interventional studies are scarce (1,2).

Objectives

To investigate the effect of HCQ treatment on
- traditional cardiovascular risk factor profile
- vascular function, measured with pulse wave analysis (PWA), in patients with RA and SLE

Patients and methods

Thirty-nine patients with RA or SLE were screened for the study.
Thirty-two patients with RA (n=25) or SLE (n=7) met inclusion criteria (Table 1).
Descriptive data are presented in Table 2

Study procedure
Assessments at baseline, after 4 and 8 weeks of treatment with HCQ (Fig 1):
Blood samples: Total cholesterol (CHOL), triglycerides (TG), low density lipoprotein (LDL), high density lipoprotein (HDL), apolipoproteins ApoA1 and B, Lipoprotein (a), blood-glucose, HbA1c
Vascular function, as measured with pulse wave analysis (Arteriograph®; Fig 2): Pulse wave velocity (PWV), augmentation index (Aix), blood pressure (central/peripheral)

Statistics: Comparison over time was performed with Friedman´s test and further with the Wilcoxon paired test as appropriate

The study was approved by the Swedish Medical Products Agency, EudraCT nr 2014-005418-45.

Table 1. Inclusion criteria

- Male or female, 18-65 years of age
- ACR criteria for RA and SLE(4)
- <10mgPrednisolone, daily dose
- Low-medain disease activity:
  - DAS28 <4,6
  - SLEDAI-2k<6

Table 2. Descriptive data for 32 patients with RA or SLE, treated with HCQ

	RA (n=25)	SLE (n=7)
Age, yrs	53	54
Female/male	21/4	7/0
Disease duration, yrs	17	14
DAS28	2.7	
SLEDAI		2

| Procedures	Screening Week -2	Week 0	Week 4	Week 8
Informed consent	X			
Inclusion/Exclusion Criteria	X			
SLEDAI-2k (SLE)	X			
DAS 28 (RA)	X			
Medical history and Present medication	X			
Vital signs (pulse and Blood pressure)	X			
Pregnancy test	X			
Visus Color vision	X			
Blood samples:				
Chol	X	X	X	X
TG	X	X	X	X
HDL	X	X	X	X
LDL	X	X	X	X
ApoA1		X	X	X
ApoB		X	X	X
Lp(a)		X	X	X
HbA1c	X	X	X	X
B-glc	X	X	X	X
CRP	X	X	X	X
Serum for storage -20=C.		X	X	X
PWV including Pulse and blood pressure and AIX		X	X	X

Fig 1. Study procedure, assessments
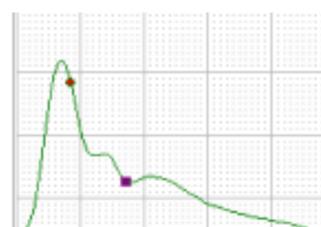
Fig 2. Vascular function by Arteriograph®
Source: arteriografi.blogspot.se and
http://www.arteriograph.hu/en/arteriograph/parameters

References:
1. Rempenault C, Combe B, Barnetche T, Gaujoux-Viala C, Lukas C, Morel J, et al. Metabolic and cardiovascular benefits of hydroxychloroquine in patients with rheumatoid arthritis: a systematic review and meta-analysis. Ann Rheum Dis 2018;77:98–103.
2. Benvenuti F, Gatto M, Larosa M, Iaccarino L, Punzi L, Doria A. Cardiovascular risk factors, burden of disease and preventive strategies in patients with systemic lupus erythematosus: a literature review. Expert Opin Drug Saf 2015;14:1373–85

Conclusions

Hydroxychloroquine treatment for 8 weeks in RA and SLE
- ❖ **significantly improved several variables reflecting the lipid profile**
- ❖ **improved HbA1C numerically**
- ❖ **did not affect the vascular function**

Results

❖ Several **lipid levels** decreased already after 4 weeks and remained significantly decreased after 8 weeks (Table 3). This was true for:
 ❖ The CHOL level (p=0.005)
 ❖ The LDL level (p=0.002)
 ❖ The ApoB level (p=0.033)
 ❖ Also Lp(a) decreased, however not significantly

❖ HbA1c-levels decreased numerically over 8 weeks, but the change did not reach statistical significance (p=0,158)

❖ No significant changes were seen in the vascular function (Table 4)

Variable	Week	Median	Q1	Q3	P
Chol mmol/L	0	5,3	4,8	6,3	
	4	4,9	4,48	5,72	
	8	5,0	4,5	5,7	0,005
LDL mmol/L	0	3,0	2,28	3,58	
	4	2,65	2,38	3,12	
	8	2,7	2,28	3,13	0,002
ApoB g/L	0	0,905	0,825	1,105	
	4	0,890	0,768	1,052	
	8	0,900	0,790	1,015	0.033
HbA1c mmol/mol	0	36,0	33,25	39,00	
	4	35,5	32,00	39,25	
	8	35,0	33,00	37,00	0,158
Variable	**Week**	**Median**	**Q1**	**Q3**	**P**
TG mmol/L	0	1,0	0,795	1,325	
	4	0,9	0,800	1,250	
	8	1,0	0,800	1,200	ns
HDLmmol/L	0	1,88	1,51	2,20	
	4	1,85	1,42	2,20	
	8	1,86	1,58	2,22	ns
ApoA1 g/L	0	1,67	1,50	1,98	
	4	1,69	1,48	1,93	
	8	1,67	1,51	1,88	ns
Lp(a) nmol/L	0	19,0	8,0	68,25	
	4	17,5	8,75	63,75	
	8	16,5	9,0	62,5	ns

Table 3. Lipids, lipoproteins, apolipoproteins and HbA1C over 8 weeks treatment with HCQ

Variabel	Week	Median	Q1	Q3	P
Pulse wave velocity, m/s	0	8,4	7,4	10,3	
	4	8,5	7,2	10,1	
	8	8,7	7,8	9,4	ns
Syst BP, periph mm Hg	0	129,3	112,3	143,0	
	4	128,3	18,7	142,0	
	8	131,0	119,3	145,7	ns
Pulse pressure, aortic , mm Hg	0	46,1	38,8	56,4	
	4	44,6	37,3	59,4	
	8	50,5	37,9	56,9	ns
Augmentation index, %	0	33	15	48	
	4	33	19	50	
	8	32	20	39	ns

Table 4. Variables reflecting vascular function (PWA) over 8 weeks treatment with HCQ

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